

# Oracle Financial Services Basel Regulatory Capital Basic

## User Guide

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**ORACLE**  

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**FINANCIAL SERVICES**

Oracle Financial Services Basel Regulatory Capital Basic User Guide, Release 8.0.1.0.0

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# Preface

## *Intended Audience*

Welcome to Release 8.0.0.0.0 of the Oracle Financial Services Basel Regulatory Capital Basic User Guide.

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 would be 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 would control the access rights of users.

## *Documentation Accessibility*

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## *Structure*

- 1 Introduction to Basel Regulatory Capital Basic
  - 2 Overview of OFSAA Infrastructure
  - 3 OFS Basel Regulatory Capital Application
  - 4 Application Processing
  - 5 Reporting
  - 6 Process Tuning
- A Frequently Asked Questions
- Glossary

## *Related Information Sources*

- Oracle Financial Services Basel Regulatory Capital Basic Release 8.0.0.0.0, Installation Guide
- Oracle Financial Services Basel Regulatory Capital Basic Admin Guide
- Oracle Financial Services Basel Regulatory Capital Analytics User Guide

## What's New in this Release

In the OFS Basel Regulatory Capital Release 8.0.0.0.0, the changes brought about by “Master Circular – Basel III Capital Regulations, No. DBOD.No.BP.BC.2 /21.06.201/2013-14” (hereinafter named as the RBI Basel III final rules) issued by the Reserve Bank of India and published in July, 2013 have been introduced.

The following enhancements have been introduced in this release to cater to Basel III regulation for India jurisdiction:

- Capital Calculations:
  - Calculation of CET1, AT1 and Tier 2 capital for Indian Banks and Foreign Bank branches in India.
  - Transitional approach for regulatory deductions and adjustments from the capital tiers.
  - Investments in the capital instruments of banking, financial and insurance subsidiaries.
  - Significant investments in paid-up equity of non-financial / commercial entities.
  - Investment in treasury stock (own stock).
  - Limited recognition of capital instruments which no longer qualify as non-common equity Tier 1 or Tier 2 capital as per the RBI Basel III final rules.
  - Recognition of Minority Interests.
- Standardized Approach:
  - Standardized approach to calculate Risk Weighted Assets for General Credit Risk for non-securitized portfolio.
  - RW assignment for non-performing assets.
  - Capital requirement for bank's exposures to Central counterparties.
  - CCF assignment for off-balance sheet items.
  - Risk weight assignment for off-balance sheet items based on the maximum risk weight determined as per either of obligor risk characteristics, account purpose or underlying type of assets.
- Securitization exposures treatment as per Standardized approach
  - Risk weighting of exposures such as rated exposures with a long term rating of B+ and below when held by originator, unrated securitization exposures except an eligible liquidity facilities, credit enhancements which are first loss positions etc at 1111% instead of deducting these exposures from capital.
  - Treatment of securities devolved on originator through underwriting.
  - Treatment of excess sellers interest.
- Capital ratios covering phase-in, phase out, transitions, qualifying exposure and so on.
- Counterparty Credit Risk calculation as per Current Exposure Method.
- CVA capital charge calculation as per Standardized approach.
- Market Risk charge calculation as per Standardized approach.
- Operational Risk charge calculation as per Basic Indicator approach.
- Calculation of Leverage ratio from Capital Measure and Exposure Measure.



# Chapter 1 Introduction to Basel Regulatory Capital

## 1.1 Overview

In 1988 Bank for International Settlements came out with the first guidelines on capital adequacy called the Basel I accord. Basel I, that is, the 1988 Basel Accord, 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 is a compilation of the June 2004 Basel II Framework, the elements of the 1988 Accord that were not revised during the Basel II process, the 1996 Amendment to the Capital Accord to incorporate Market Risks. No new elements have been introduced in this compilation.

The major outlines of Basel II accord is to comply with the three pillars.

- The First Pillar - Minimum Requirements for  
Tier 1, Tier2 and Tier3 Capital  
Credit Risk  
Market Risk  
Operational Risk
- The Second Pillar - Supervisory Review Process and
- The Third Pillar - Market Discipline

Changes relating to Securitization from Basel 2.5 accord as incorporated in the previous versions of the OFS Basel Regulatory Capital Release are prevalent in the current release as well.

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.
- **Leverage Ratio:** In addition, 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 in excess of 3%.
- **CVA Risk:** Basel III introduced CVA risk charge in addition to counterparty default risk charge for Over the counter derivative portfolio.
- **Liquidity Coverage and Net Stable Funding Ratio:** The Liquidity Coverage Ratio requires a bank to hold sufficient high-quality liquid assets to cover its total net cash outflows over 30 days; the Net Stable Funding Ratio requires the available amount of stable funding to exceed the required amount of stable funding over a one-year period of extended stress.

## 1.2 Key Benefits

The advantages that you can gain from the OFS Basel Regulatory Capital application are as follows:

- One integrated application which allows for multiple jurisdictional computations.
- Different approaches have been 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.
- Extensive, pre-built instrument coverage, built to meet Basel II and III guidelines, which means banks can get “up and running” quickly with minimal preprocessing.
- It is a fully transparent application where all Rules and Approaches are visible to business users and reviewers/auditors.
- Audit Trail is present to maintain accountability of Rules changes, user activity, or system modifications.
- Integrated Stress Testing Framework. This Assess regulatory capital requirements under stress scenarios as per guidelines within a single system for:
  - Compliance
  - Strategic decision making
  - Capital planning
- Comprehensive and user-friendly modeling framework providing industry-standard statistical techniques and business models for PD, LGD, and Exposure at Default (EAD).
- The application has the capability to build or host models.

### ***1.3 Application’s Interface with Other Financial Services Components***

#### **Analytical Applications Reconciliation Framework**

After data is configured into the relevant tables, you also have an option to perform General Ledger (GL) Reconciliation using our OFS Analytical Applications Reconciliation Framework.

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**NOTE:** The Oracle Financial Services Analytical Applications Reconciliation Framework has to be additionally licensed by the bank.

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OFS Analytical Applications Reconciliation Framework compares the balances from the bank’s operational systems, to the balances in the bank’s financial systems, which are reflected in the GL. Thus, the OFS Analytical Applications Reconciliation Framework finds out differences, if any, between the two. On the basis of such reconciliations, adjustment entries are passed when required, to ensure that the data from the operational systems tally with the balances in the GL. If you have identified the account or contract that is responsible for the difference, then you can rectify the difference by posting a correction entry on that account. Therefore, OFS Analytical Applications Reconciliation Framework aims to bring the operational system at par with the financial system (GL) by passing adjustment entries, or correction entries, or both.

*For more information on the Oracle Financial Services Analytical Applications Reconciliation Framework, refer to the Oracle Financial Services Analytical Applications Reconciliation Framework User Manual.*

#### **Operational Risk Economic Capital**

Basel regulation defines Operational risk (in Para 644 BCBS 128 - Basel II dated June 2006) as the risk of loss resulting from inadequate or failed internal processes, people and system or from external events. Oracle Financial Services Operational Risk Economic Capital is responsible for providing a framework for identifying, measuring, monitoring, and managing all risks within the scope of the definition of operational risk. Oracle Financial Services Operational Risk Economic Capital (OREC) application enables you to model the distribution of potential losses due to operational risk. In this application, we propose a loss distribution

based approach consistent with Basel - II guidelines, to estimate the Economic Capital for the Operational Risk at the firm level. Oracle Financial Services Operational Risk Economic Capital Application facilitates the calculation of potential losses due to operational risk using the LDA approach. The application is capable of reporting the losses due to operational risk at reporting group level (standardized) as well as at firm level.

### **Loan Loss Forecasting and Provisioning**

International Financial Reporting Standards (IFRS) guidelines have set out requirements on classification and measurement of financial assets and liabilities. It specifies two approaches for the measurement of assets namely *Amortized Cost* and *Fair Value* approach. The 3 phases in which IFRS 9 is issued is as follows:

- Phase I: Classification & measurement
- Phase II: Impairment
- Phase III: Hedge Accounting

Oracle Financial Services Loan Loss Forecasting & Provisioning addresses the requirements of Phase II (Impairment) of IFRS 9. The exposure draft on Phase II requires institutions to adopt an Expected Loss approach for impairment provisions. LLF&P supports two approaches (Incurred Loss and Expected Loss) to impairment provision calculations. LLF&P fills a key gap in bank's credit risk suite of applications. Basel committee has strongly supported the move from incurred loss approach to expected loss approach for provisioning calculation.

### **Market Risk**

Oracle Financial Services Market Risk is concerned with the estimation of market risk for the portfolios held by the bank. These portfolios may belong to the trading book or the banking book. Oracle Financial Services Market Risk enables a bank to estimate the market risk of a portfolio based on its underlying positions, through the estimation of risk measures such as Value-at-Risk, Conditional Value-at-Risk and so on. It also enables a bank to carry out Stress Testing and Back Testing procedures for validation.

Risk measures based on VaR have multiple applications; the scope of Oracle Financial Services Market Risk is not only restricted to Regulatory Reporting but also extends to the internal reporting needs of the bank. Oracle Financial Services Market Risk supports the estimation of market risk of user-defined portfolios covering a wide range of instruments.

### **Credit Risk Economic Capital**

Economic Capital is the capital level required by the bank to cover the losses within a given probability. Economic capital is attributed mainly to three risks: Credit Risk, Operational Risk and Market Risk. Economic Capital methodologies can be applied across products, lines of business and other segments as required. Basel Committee, as a part of pillar 2 requirements in Basel accord, emphasizes banks to have their own methods, processes to calculate adequate capital for the risk they assumed. The focus on Economic Capital calculation is industry-wide to measure risk, to optimize performance by reallocating capital to strategically important businesses as well as businesses with high returns. An Economic Capital framework relates the risk of investment to the amount of capital required, thus putting business performance or investment return into a proper perspective relative to risk.

On identifying the risk type, EC is computed according to the asset class of the counterparty. Different approaches are followed for counterparties falling under different asset class. The asset type prescribed according to Basel is:

- Corporate
- Sovereign
- Retail
- Specialized Lending



- Securitization
- Banking Book
- Other Assets

### **Liquidity Risk Management**

Liquidity Risk Management (LRM) has emerged as a critical risk management function for banking institutions, as regulators increasingly require banks to have a robust liquidity management framework in place. As per the Basel Committee on Banking Supervision (BCBS), “*liquidity is the ability of a bank to fund increases in assets and meet obligations as they come due, without occurring unacceptable losses*”.<sup>1</sup> Oracle Financial Services Liquidity Risk Management, Release 2.0, is designed to address liquidity risk of banking institutions across the world. It allows institutions to comply with the Individual Liquidity Adequacy Standards (ILAS) or similar standards issued by other regulators. The objective of the LRM Application is to provide a control system to financial institutions to help them identify, measure, monitor, and manage liquidity risk.

Oracle Financial Services Liquidity Risk Management, Release 2.0 supports the following functionalities:

- Supports storage and reporting of cash flows (BAU, Stress) across natural, local, and reporting currencies.
- Liquidity Gap Calculation
- Liquidity Coverage and Funding Concentration Calculation
- Defining Counterbalancing Strategies

### **ICAAP**

*International Convergence of Capital Measurement and Capital Standards-A Revised Framework*, (popularly known as Basel II), was issued by the Basel Committee of Banking Supervision (BCBS) in June 2004. The revised framework aims for significantly more risk-sensitive capital requirements than the 1988 Basel I Accord and is based on three mutually-reinforcing pillars: minimum capital requirements, supervisory review and market discipline.

Pillar 1 covers minimum capital requirements for credit, market and operational risk. Pillar 2 (Supervisory Review) comprises of Internal Capital Adequacy Assessment Process (ICAAP) followed by the Supervisory Review and Evaluation Process (SREP). Pillar 3 (Market Discipline) includes disclosure requirements or reporting. Thus, ICAAP covers the Pillar 2 of the Basel II Accord and is followed by SREP.

ICAAP is a firm’s internal assessment of capital that is considered as adequate to cover all material risks to which it is exposed. ICAAP is applicable to all banks irrespective of their size and complexity and its implementation is one of the major challenges faced by banks.

While the objective of Oracle Financial Services ICAAP Assessments is to fill in the gap in the Oracle Financial Services ICAAP offering, this application can also be used as a standalone application.

Pillar 2 guidelines of Basel II accord require *banks to have policies and procedures designed to ensure that the bank identifies, measures, and reports all material risks..... All material risks faced by the bank should be addressed in the capital assessment process.* Thus, the banks are required to identify all the risks and determine which risks are materials to the bank.

Further, ICAAP is based upon the principle of proportionality which states that the specific design of the bank’s ICAAP is proportionate to the risk level, complexity and the scale of a bank’s activities.

The guidelines on **Bank-Wide Risk Management - Internal Capital Adequacy Assessment Process of OENB, Austria** states that:

“The decision as to which systems are useful and appropriate in which areas for each bank should be made

on the basis of the bank's specific risk structure. Based on indicators, the bank itself should identify the areas in which it should employ more complex risk measurement and management methods as well as the areas in which simpler methods would suffice." Thus, a bank may use a standardized approach for market risk under ICAAP, in case the materiality assessment of market risk is low but will be expected to use sophisticated modeling based approach if market risk is highly material for the bank.

### **Retail Portfolio Risk Models and Pooling**

Under the Capital Adequacy framework of Basel II, banks are permitted to group their loans to private individuals and small corporate clients into a Retail Portfolio. As a result, they are able to calculate the capital requirements for the credit risk of these retail portfolios rather than for the individual accounts. Basel accord has given a high degree of flexibility in the design and implementation of the pool formation process. However, creation of pools can be voluminous and time-consuming. Oracle Financial Services Retail Portfolio Risk Models and Pooling, Release 3.4 classifies the retail exposures into segments (pools) using OFSAAI Modeling framework.

Oracle Financial Services Retail Portfolio Risk Models and Pooling, Release 3.4, uses modeling techniques available in OFSAAI Modeling framework. The RP application restricts itself to the following operation:

- Sandbox (Dataset) Creation
- RP Variable Management
- Variable Reduction
- Correlation
- Factor Analysis
- Clustering Model for Pool Creation
- Hierarchical Clustering
- K Means Clustering
- Report Generation
- Pool Stability Report
- OFSAAI Modeling framework provides Model Fitting (Sandbox Infodom) and Model Deployment (Production Infodom). Model Fitting Logic will be deployed in Production Infodom and the Pool Stability report is generated from Production Infodom.

### **Basel Regulatory Capital Analytics**

For more information Basel Regulatory Capital Analytics refer to *Reporting* on page 312.

### **Credit Risk Management**

Oracle Financial Services (OFS) Credit Risk Management facilitates in obtaining an enterprise-wide comprehensive view of credit risk metrics in a single instance. Financial institutions can obtain a single customer view of credit risk across exposures spread over multiple product types, lines of business, geographies, and legal entities. The out of the box capability of the application supports pre-built reports covering credit quality, reserves, delinquency, new business, risk migration, capital requirement, collection, and concentration.

## Chapter 2 Overview of OFSAA Infrastructure

### 2.1 Components of OFSAA Infrastructure

Oracle Financial Services Analytical Applications Infrastructure (OFSAAI) is a complete end-to-end web-based business intelligence solution that provides tools for data integration, mart building, query and analysis, intelligent alerting, and information delivery. OFSAAI enables financial institutions to measure and meet risk-adjusted performance objectives, cultivate a risk management culture through transparency, lower the costs of compliance and regulation, and improve insight into customer behavior. Data in the Basel Regulatory Capital Requirement application is configured and computed using the components of OFSAAI. The main objective of this section is to familiarize you with the important modules of OFSAAI to help understand the functionality of the Basel Regulatory Capital Requirement application.

This module documents the following:

- Unified Metadata Manager

Data Integrator Framework

Data Entry Forms and Queries

Metadata Browser

Business Metadata Management

- Rule Framework
- System Configuration

Segment/Metadata mapping

- Administration

Save metadata

Utilities

- User Group Batch execution Map

### 2.2 Access OFSAA Infrastructure

Infrastructure can be accessed through your web-browser as soon as the System Administrator (SA) installs and configures Oracle Financial Services Analytical Applications Infrastructure. The SA will provide you with a link through which you can access Oracle Financial Services Analytical Applications Infrastructure. You can access the Infrastructure application using this link. *For more information on Starting Infrastructure Servers, refer OFSAAI 7.3 Installation manual.*

#### 2.2.1 OFSAA Infrastructure Login

While accessing OFSAAI, the *Splash screen* is as displayed:

You can select the required language from the **Language** drop-down list. The language options displayed in the drop-down are based on the license. Enter the **User ID** and **Password** provided by the System Administrator and click **Login**. You will be prompted to change your password on your first login. Alternatively, you can also choose to change your password any time.

Refer to the following guidelines for Password Creation:

- Passwords are displayed as asterisks (stars) while you enter. This is to ensure that the password is not revealed to other users.
- Ensure that the entered password is at least six characters long.
- The password must be alphanumeric with a combination of numbers and characters.
- The password should not contain spaces.
- Passwords are case sensitive and ensure that the Caps Lock is not turned ON.

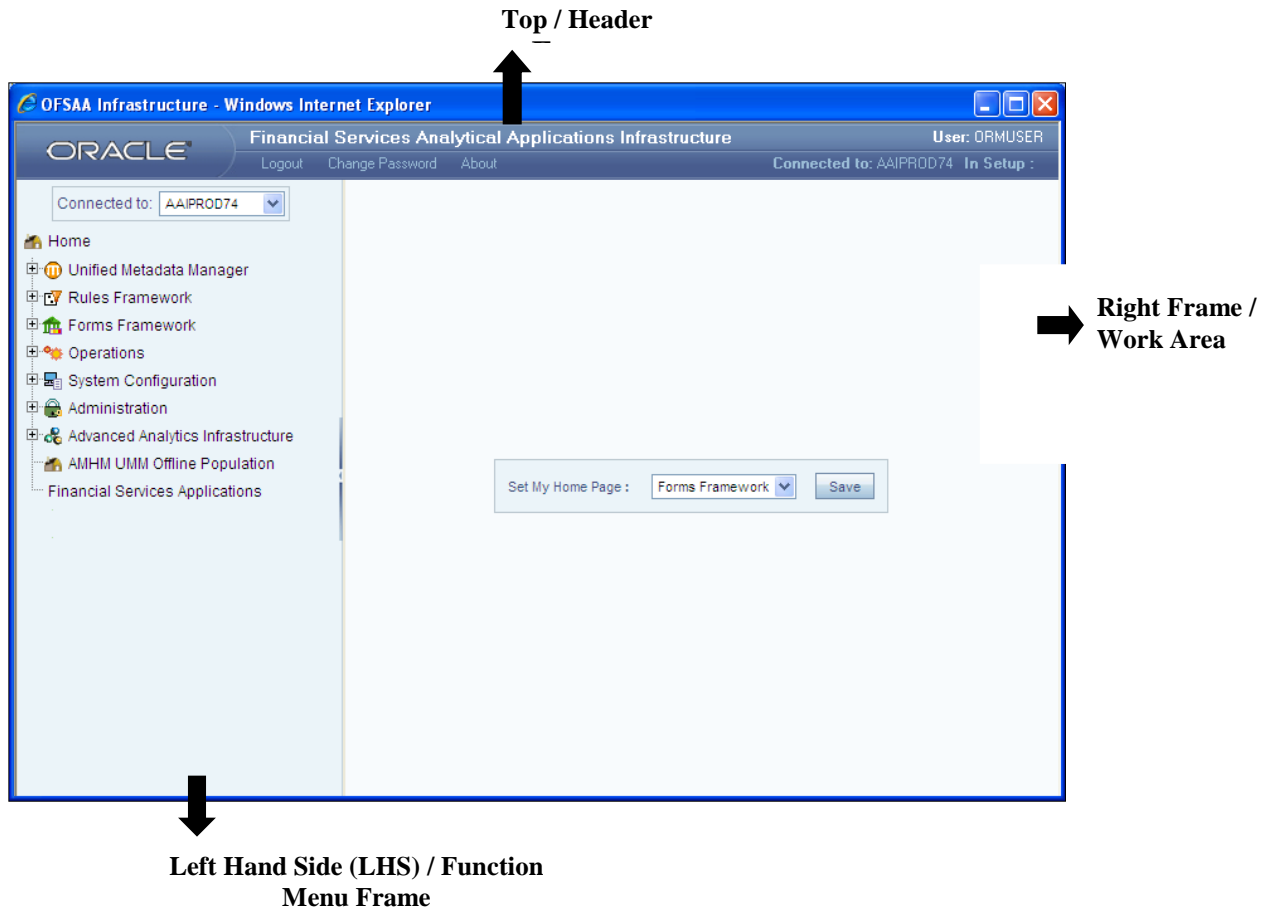
- By default, the currently used password is checked for validity if password history is not set.
- New password should be different from previously used passwords based on the password history, which can be configured.

If you encounter any of the following problems, contact the System Administrator:

- Your user ID and password are not recognized.
- Your user ID is locked after three consecutive unsuccessful attempts.
- Your user ID has been disabled.
- Guest user cannot change the password.

### **OFSAAI Splash Screen**

On successful login, the Infrastructure splash screen is displayed. The splash screen is divided into three frames as depicted in the following image:



The **Header** frame displays the user details along with the Information Domain selected in the right hand corner in top frame of the screen. To exit Oracle Financial Services Analytical Applications Infrastructure, click **Logout**. The built-in security system of the Infrastructure ensures restricted access to the respective screens based on the user's role. This is based on the functions that you as a user are required to perform.

The Function Menu frame displays the Information Domain to which you are connected. The main functions of Oracle Financial Services Analytical Applications Infrastructure, which appear as expandable folders contains submenus with different options. Click "+" to expand the function menu folder. The function menu displays the list of submenus/options. Click the required menu option to open the respective screen.

## 2.3 *Unified Metadata Manager*

Unified Metadata Manager is intended for the Information and Business Analysts who are instrumental in supporting and affecting analytical decisions. It provides a consistent view of the business dimensions and key measures. OFSAAI's unique Unified Metadata technology allows your enterprise to define a consistent set of business terms and securely deploy them across the entire range of analytic applications. The following sections within the Unified Metadata Manager are relevant for processing of Basel Regulatory Capital:

- Data Integrator Framework
- Data Entry Forms and Queries
- Metadata Browser
- Business Metadata Management

### 2.3.1 **Data Integrator Framework**

Data Integrator framework within the infrastructure system is a comprehensive data integration platform that facilitates all the data integration requirements from high-volume and high-performance batch loads to event-driven integration processes and SOA-enabled data services. Data Integrator is a software application based on the ETL (Extract-Transform-Load) structure, which is used for data transformation and merging. In Data Integrator, you can standardize and integrate the data from various source systems into a single standard format for data analysis. To better understand the OFS Basel Regulatory Capital application, the following components of the Data Integrator framework is elaborated in this section.

- Warehouse Designer
- Post Load Transformation

#### **Warehouse Designer**

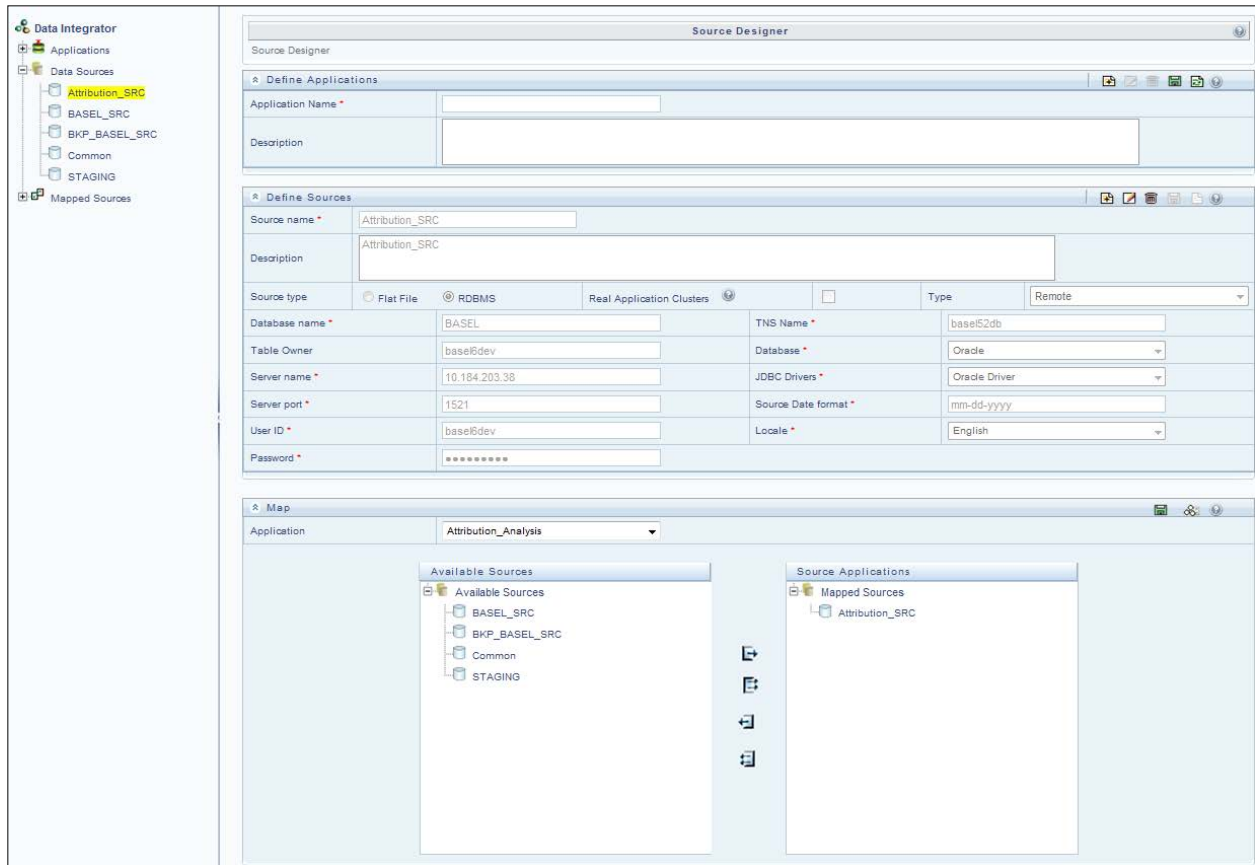
In the Warehouse Designer, you can define Data Source Models, Map Data Source to Applications, and associate Database Extracts to a Table/File for data extraction. The Warehouse Designer consists of the following sections:

- Data Sources
- Database Extracts
- File Extracts

#### ***Data Sources Designer***

Data Sources Designer within the Data Integrator Framework of the Infrastructure facilitates you to generate data models by defining and mapping the required applications and data sources. You (Business Analysts) need to have ETL Analyst function role mapped to access the Data Integrator framework. The **Source Designer** screen displays the list of pre-defined applications, Data Sources, and Mapped Sources in the LHS menu and consists of three sections namely: Define Applications, Define Sources, and Map. In the **Source Designer screen** you can:


- Define Data Source Applications
- Define Data Sources
- Map Data Sources to Applications
- Generate Data Models for each Application





## Define Data Source Application


A data source application is a logical group of data sources. You can define data source applications and modify or remove the application details in the *Source Designer* screen. To define Data Source applications in the Define Applications grid:

1. Enter the **Application Name** by which you can identify the application.
2. Enter a description or related information about the application.


The application details should contain the name and information pertaining to the source data required. For example: *ABC Corporate* can be the source application, *ABC Corporate sales* can be the description and data can be extracted from Oracle database, which has RDBMS Source Type. Click  icon in Define Applications tool bar and save the application details.

You can also click  icon to define another application or click  icon to clear the specified details.


To **Edit** the Data Source Applications description, in the Define Applications grid:

1. Select the required application from the LHS menu. The application details are displayed in the Define Applications grid.
2. Click  icon in the Define Applications tool bar.
3. Edit the application description as required.



4. Click  button and save the application details.

To **Delete** Data Source applications in the Define Applications grid ensure that there are no data sources mapped. If a model is generated using the application, the data sources cannot be unmapped and hence the application cannot be deleted.

1. Select the required application from the LHS menu. The application details are displayed in the Define Applications grid.
2. Click  button in the Define Applications tool bar. Click **OK** in the information dialog to confirm deletion.

### Define Data Sources

Data Source refers to the physical structure or location of the source file. Data Source can either be a file or a table with rows and columns and can reside on a remote server or on a local desktop machine. Applications access Data Source using a FTP connection. You can define Data Sources and also modify or remove the Data Source details in the *Source Designer* screen. To define Data Source in the Define Sources grid:

1. Enter the **Source Name** of the data source.
2. Enter a description or related information about the application.
3. Select the **Source Type** as either Flat File (default) or RDBMS.

If **Flat File** Source Type is selected, select the server **Type** as either Local or Remote from the drop down list, and enter the details as tabulated:

---

**NOTE:** For source type as Flat File - Remote, the fields i.e. Server port, FTP drive, FTP share, Source date format, and password are mandatory.




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Field	Description
Fields marked in red asterisk (*) are mandatory.	
Local	Specify the Source Date Format to be used as default date format for source data extraction and mapping, which is unless modified in the <i>Define Extracts</i> screen.
Remote	<ul style="list-style-type: none"> <li>▪ <b>Server Name:</b> Enter the Server Name or IP address where the Data Source exists.</li> <li>▪ <b>User ID:</b> Enter the FTP User ID required to connect to the server.</li> <li>▪ <b>Server Port:</b> Enter the active server port number which contains the flat files.</li> <li>▪ <b>Password:</b> Enter the FTP user password required to connect to the server.</li> <li>▪ <b>FTP Drive:</b> enter the FTP server path. In case of Unix Servers, the home directory path is taken by default.</li> <li>▪ <b>Source Data Format:</b> Enter the Source Date Format which will be used as the default date format for source data extraction and mapping, and which is unless modified in the <i>Define Extracts</i> screen.</li> <li>▪ <b>FTP Share:</b> Enter the ASCII files location for loading if it is located in the staging area other than the default staging area of Infrastructure Database Server.</li> </ul>



If **RDBMS** Source Type is selected, specify the source type details as tabulated. The available options are based on the state of **Real Application Clusters** checkbox.

Field	Description
Fields marked in red asterisk (*) are mandatory.	
If Real Application Clusters (RAC) checkbox is selected	<ul style="list-style-type: none"> <li>▪ <b>User ID:</b> Enter the Database User ID, which is also assumed as the Schema name if it is the Oracle database and if the Table Owner field is left blank.</li> <li>▪ <b>Source Data Format:</b> Enter the Source Date Format which will be used as the default date format for source data extraction and mapping.</li> <li>▪ <b>Password:</b> Enter the Database user password required to connect to the server.</li> <li>▪ <b>Locale:</b> Select the language using which the Infrastructure Database components are installed. The available options depend on the languages defined in the “configuration” table.</li> <li>▪ <b>JDBC URL:</b> Enter the JDBC (Java Database Connectivity) url configured by the administrator to connect to the database.</li> <li>▪ <b>Table Owner:</b> Enter the schema name in case of Oracle database, or Owner of Database Tables in case of SQL Server and other Databases.</li> <li>▪ <b>TNSNAME:</b> It is the SQL*Net configuration file that defines databases address to establish connection. Enter the TNSNAME created for the Information Domain. Also ensure that:  It is mandatory to enter the TNS Name if it is the Oracle database.  The field is inactive if SQL or DB2 database is selected.</li> </ul>
If Real Application Clusters (RAC) checkbox is not selected	<ul style="list-style-type: none"> <li>▪ <b>Database Name:</b> enter the name of the Source Database from which the extraction is required to be done.</li> <li>▪ <b>TNSNAME:</b> It is the SQL*Net configuration file that defines databases address to establish connection. Enter the TNSNAME created for the Information Domain.</li> <li>▪ <b>Table Owner:</b> Enter the schema name in case of Oracle database, or Owner of Database Tables in case of SQL Server and other Databases.</li> <li>▪ <b>Database:</b> Select the Database from the drop down list.</li> <li>▪ <b>Server Name:</b> Enter the Server Name or IP address where the Data Source exists.</li> <li>▪ <b>JDBC Drivers:</b> Select the JDBC (Java Database Connectivity) driver from the drop down list.</li> <li>▪ <b>Server Port:</b> Enter the active port number of the server which contains the flat files.</li> <li>▪ <b>Source Data Format:</b> Enter the Source Date Format which will be used as the default date format for source data extraction and mapping, unless modified in the <i>Define Extracts</i> screen.</li> </ul>


Field	Description
	<ul style="list-style-type: none"> <li>▪ <b>User ID:</b> Enter the FTP User ID required to connect to the server.</li> <li>▪ <b>Locale:</b> Select the language using which the Infrastructure Database components are installed. The available options depend on the languages defined in the “configuration” table.</li> <li>▪ <b>Password:</b> Enter the Database password required to connect to the server.</li> </ul>

4. Click  icon in Define Sources tool bar and save the Data Source details. You can also click  icon to define another Data Source or click  icon to clear the specified details.

To **Edit** Data Source in the Define Sources grid:

1. Select the required Data Source from the LHS menu. The Data Source details are displayed in the Define Sources grid.
2. Click  button in the Define Sources tool bar.
3. Edit the Data Source details as required. You can update all the details except the Source Name, Source Type, and Real Application Cluster option selected.
4. Click  button and save the Data Source details.

To **Delete** Data Source in the Define Sources grid, ensure that there are no applications mapped. If a model is generated using the Data Sources, the same cannot be unmapped and neither be deleted.



1. Select the required Data Source from the LHS menu. The Data Source details are displayed in the Define Sources grid.
2. Click  button in the Define Sources tool bar. Click **OK** in the information dialog to confirm deletion.


### Map Data Sources to Applications

You can associate the defined data sources to the required applications using the Map functionality. You can map one or more data sources to serve multiple applications and load separate sources of data into the warehouse. When mapped, the application and all the associated data sources are grouped. You can identify the source data with reference to the source business application. To Map Data Sources to Application in the Map grid, select the required **Application** to map the Data Sources. Do one of the following:

- Select the Application from the Mapped Sources list in the LHS menu.
- Select the Application from the Application drop down in the Map grid.

On selection, the mapping details for the selected Application are displayed in the *Available Sources (available)* and *Source Applications (mapped)* list. To map the Data Source to the selected Application, do one of the following:

- Select the required Data Source, from the Available list and click  button. You can press Ctrl key for multiple selections.
- To map all the listed Data Sources to the application, click  button.

You can also remove data source mapping by selecting from Source Applications list and clicking  icon.

To remove all selected Data Sources mapping, click  icon. Click  icon and save the mapping details.

## Generate Source Models

Once you have defined and mapped the Data Sources to the required Application, you can generate the Source Models and extract the application data sources to populate data into the warehouse. The source models for each application-source combination are imported into the infrastructure metadata repository. You can generate Source Model only for RDBMS data source using Data Catalogs that are defined in the database. To generate Source Model in the *Source Designer* screen:

1. Select the required **Application** which has the RDBMS data sources mapped. Do one of the following:
  - Select the Application from the **Mapped Sources** list in the LHS menu.
  - Select the Application from the **Application** drop down in the Map grid.

On selection, the data source mapping details for the selected Application are displayed in the *Available Sources* and *Source Applications* list.

2. Select the RDBMS Data Source from the *Source Applications* list.
3. Click **Generate Source Model** icon from the Map grid tool bar.

In the *Generate Source Model* screen, you can generate Source Model using Data Catalogs. You can specify the Filter criteria for selection. Filters are patterns for entity names in the Database and can restrict the source model generation to a specific set of entities. Specify the filter entries by entering details in the “Starts with”, “Contains”, and “Ends with” fields. The Source Model is generated even if one of the specified filter conditions matches. You can also specify multiple conditions for a single filter type using comma-separated values. For example, tables starting with TB and TM can be specified as “TB, TM”.

4. Click **Generate**. The Source Model is generated and the status is displayed in a confirmation dialog. Click **OK**.

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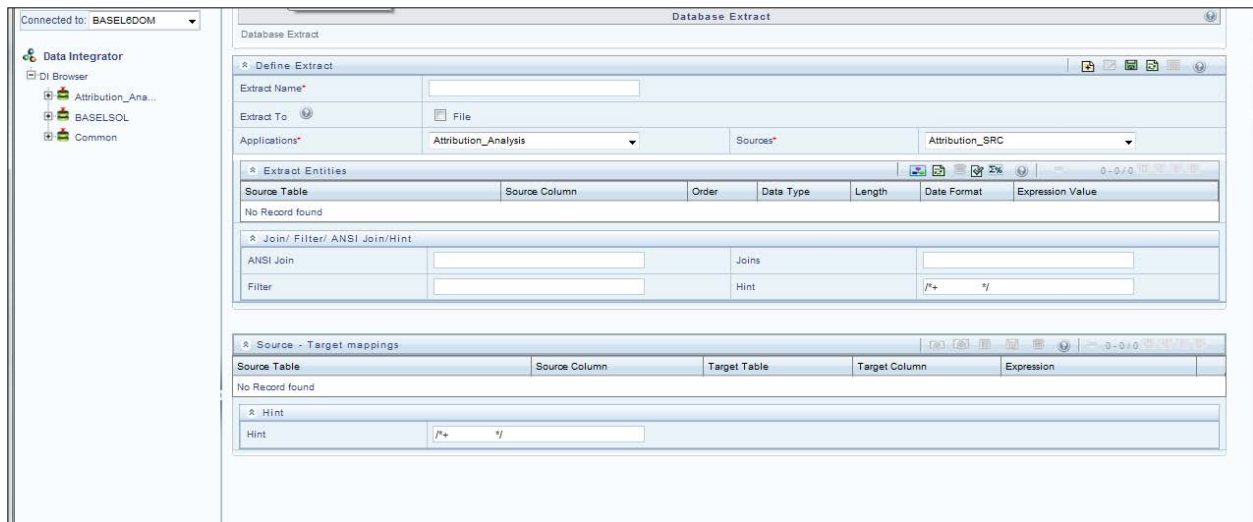
**NOTE:** If the Source Model has already been generated, a confirmation dialog is displayed to replace the existing model. Click **OK** or **Cancel**.

---

The Source Model is generated in the specified directory which has to be extracted or transferred to the Business Data Model.

## Database Extracts

Data extraction refers to the process of retrieving unstructured data from data sources for further data processing, storage, or migration. You can extract data sources to a Table or a File. You (Business Analysts) need to have ETL Analyst function role mapped to access the Data Integrator framework within the Infrastructure system.



The *Database Extracts* screen displays the list of pre-defined Database Extract Mappings in the LHS menu and the options to define and Map the Data Sources to populate the required Table or File. You can also make use of Pagination option to view the list of pre-defined Database Extracts within the system. In the *Database Extracts* screen of the Warehouse Designer, you can:

- Define extracts, Entities, and related Properties
- Map the Source to Target model (table or file)

### Database Extraction

The *Database Extracts* screen facilitates you to extract data sources to a Table or a File. Extract to Table option is supported only when the source and target tables belong to the same database type. You can **Load** data incrementally from any RDBMS data source to a table based on certain criteria and **Extract** data to a file along with the other sources. The various sections and the available options in the *Database Extracts* screen are as tabulated:

- In the Define Extract grid, you can define the Database Extract details.
- In the Extract Entities grid, you can define expressions to join tables and specify filter for data extraction.
- In the Source-Target Mappings grid, you can map the source table of a selected Information Domain to the target model.

### Define Database Extracts and Map Table to Table

You can extract data from source table to the required table in the *Database Extracts* screen. By default, Extract to Table option is enabled in the *Database Extracts* screen. Extraction to Table is supported only when the source and target tables belong to the same database type. Extract to Table does not have any definition (Source) properties. To extract data source to table, do the following:

The screenshot shows the Oracle Financial Services Analytical Applications Infrastructure interface. The main window is titled "Database Extract". It has a menu bar with "ORACLE", "Financial Services Analytical Applications Infrastructure", "Logout", "Change Password", and "About". The user is logged in as "User: p0user" and connected to "AAIProd74".

The "Define Extract" section includes:

- Extract Name: Prd\_ext\_1
- Extract To:  File
- Applications: Attribution\_Analysis
- Sources: ATTRIBUTION\_SRC

The "Extract Entities" section contains a table with the following data:

Source Table	Source Column	Order	Data Type	Length	Date Format	Expression Value
BP_MEAS_IJAP	V_BP_CODE	1	String	10		
BP_MEAS_IJAP	V_MEAS_CODE	2	String	10		
BP_MEAS_IJAP	V_MEAS_TYPE	3	String	1		

The "Join/ Filter/ ANSI Join/ Hint" section includes:





- ANSI Join: Ans\_Prd\_ext, Joins: 2
- Filter: Ans\_Prd\_Flr, Hint: /+ FIRST\_ROWS(2) !

The "Source - Target mappings" section shows "No Record found".


The "Hint" section includes:

- Hint: /+ FIRST\_ROWS(2) !

Specify the Database Extract details in the *Define Extract* grid:

1. Enter the Extract Name. Ensure that there are no special characters or extra spaces in the name specified. Ensure that Extract to File checkbox is not selected.
2. Select the required data source Application from the drop down list.
3. Select the mapped Sources from the drop down list.
4. Select the required Entities in the Extract Entities grid:
  - a. Click  button in the Define Entities tool bar.
  - b. In the Choose Entity screen, do the following:
    - o Select the entity from the Members list by clicking on the required node, and click  button. You can search for a specific entity by entering the keywords and clicking  button. You can also deselect an entity by selecting from the Selected Members list and clicking  button.
5. Click **OK**. The selected source entities are displayed in the Define Entities grid.

Define an expression (optional) in the Extract Entities grid. If you have defined more than one Source Table in the *Choose Entity* screen, you need to define an expression to join the column data corresponding to each table:










1. Click  button in the Extract Entities tool bar.
2. In the *Specify Expression* screen, do the following:
  - o Enter the Expression Name.
  - o Select the Data Type from the drop down list. The available options are String, Date Time, Number, Integer, and Timestamp.
3. Define an expression by doing the following:
  - o Select the **Table** in the Entities section.

- Select the **Function**. You can select Transformations, Database Functions, or Extraction Functions. Extract functions are populated from the “*DATABASE\_ABSTRACT\_LAYER*” table which resides in config schema.
- Define the **Operators** by selecting Arithmetic, Concatenation, Comparison, Logical or others operators.
- Specify the ANSI Join or Join to map the table to columns and enter the filter criteria to include during extraction. For example, “\$MISDATE” can be a filter for run-time substitution of the MIS Date.


---





**NOTE:** If the defined expression uses function that has a placeholder or calls a stored procedure that has a placeholder for String data type, enclose the placeholder in single quotes. Using double-quotes would generate error during extract definition or batch execution. Also expressions with Date/Timestamp data type placeholders are not supported.

---


4. In the Expressions tool bar, you can also:
  - Click  button to view the Expression details.
  - Click  button to view the ANSI Join details.
  - Click  button to view the Joins.
  - Click  button to view the Filters.
5. Click  button to clear the details.
6. Select **Show Advanced Options** in the Expression tool bar, and do the following:
  - Click  button to and specify hints (Rules), if any. Oracle hints follow (/ \*+ RULE \*/) format. For example, /\*+ FIRST\_ROWS(2) \*/
  - Click  button to validate the query by converting to the selected RDBMS source. If Validation is successful, the Explain Plan for the SQL query is displayed. Else, the *SQL Exception* is displayed.
  - Click  button to view SQL, which acts as print command for the complete query.
7. Click **OK**. The defined Expression is displayed in the *Extract Entities* grid as *Derived Column*. The specified ANSI Join or Joins, Filter, and Hints are also displayed and can be edited.
8. Click  icon in the Define Extract tool bar and save the details.

Map Source to Target Table in the Source-Target Mappings grid.

1. Click  icon in the Source-Target Mapping tool bar. The *DI Mapping* screen is displayed.
2. Select the **Target Infodom** form the drop down list. The source details in the selected infodom are displayed in the *Definition* pane of *Target Table Map Panel*.

3. Select the Target Table from Target Entities drop down list. The selected entities are displayed in the *Target Entities* pane of *Target Table Map Panel*. To map Source to Target, do one of the following:
  - Select a Definition and Target Entity in each column and click  button.
  - Click  button to Auto-Map the selected definitions and Target Entities.
  - You can Un-Map a definition from a Target Entity by clicking  button or Un-Map All definitions by clicking  button.
  - Click **Save** and save the mapping details.

Specify the Properties in the *Source-Target Mappings* grid:


1. Click  icon in the Source-Target Mappings tool bar. The *Properties* screen is displayed.
2. Specify the properties by entering a value or selecting an option from the drop down list.

In the *Properties* screen, you can specify the **Loading Mode** as *Direct*, *Batch*, or *Bulk*. In *Bulk* mode you cannot specify the **Batch Size** and commit happens at the end of the batch load. Also in *Bulk* mode, batch loading is faster for lesser records as compared to larger number of records which sometimes lead to loss of data while loading.

---

**NOTE:** In **Batch** and **Bulk** modes if any of the foreign keys are in **Disabled** state before loading the data using T2T and the property **Disable Primary Key** is set to **Yes**, then all the Primary Keys and corresponding Foreign Keys are disabled before loading and are enabled back after loading. Hence the initial status of foreign and primary keys can be changed from Disabled to Enabled. In case of **Direct** mode the Foreign Keys will not return to its initial state.

---

3. In the *Hint* tool bar, specify Hints (if any), for faster loading. Oracle hints follow (/#+ HINT \*/) format.
4. Click  icon and save the defined Database Extracts mapping details. An information dialog is displayed on completion. Click **OK**.

### Define Database Extracts and Map Table to File


You can extract data from source table to the specified file in the *Database Extracts* screen. To extract data to a file along with the other sources, you need to define the Database Extracts and specify the Extract Entities. Source-Target mapping is not required since the table structure is completely extracted to the specified file. To extract data source to file, do the following:

Specify the Database Extract details in the *Define Extract* grid:

1. Enter the **Extract Name**. Ensure that there are no special characters or extra spaces in the name specified.
2. Select **Extract to File** checkbox.
3. Select the required data source **Application** from the drop down list.
4. Select the mapped **Sources** from the drop down list.







Specify the Source Properties in the Define Extract grid.

1. Click  icon in the Define Entities tool bar.
2. Specify the properties by entering the required value or selecting an option from the drop down list.


---

**NOTE:** Field Delimiter and Data File Locale are mandatory fields.

---

3. Select the required Entities in the Extract Entities grid.
4. Click  icon in the Define Entities tool bar.
5. In the *Choose Entity* screen, do the following:
  - Select the entity from the Members list by clicking on the required node, and click  button.
  - You can search for a specific entity by entering the keywords and clicking  button. You can also deselect an entity by selecting from the Selected Members list and clicking  button.
  - Click **OK**. The selected source entities are displayed in the Define Entities grid.


Define an expression (optional) in the *Extract Entities* grid. If you have defined more than one Source Table in the *Choose Entity* screen, you need to define an expression to join the column data corresponding to the table.









1. Click  icon in the Extract Entities tool bar.
2. In the *Specify Expression* screen, do the following:
  - Enter the Expression Name.
  - Select the Data Type from the drop down list. The available options are String, Date Time, Number, Integer, and Timestamp.
3. Define an expression by doing the following:
  - Select the **Table** in the Entities section.
  - Select the **Function**. You can select Transformations, Database Functions, or Extraction Functions. Extract functions are populated from the “*DATABASE\_ABSTRACT\_LAYER*” table which resides in config schema.
  - Define the **Operators** by selecting Arithmetic, Concatenation, Comparison, Logical or others operators.
  - Specify the ANSI Join or Join to map the table columns and enter the filter criteria to include the same during extraction. For example, “\$MISDATE” can be a filter for run-time substitution of the MIS Date.

---

**NOTE:** For expression that has a placeholder for String data type, enclose the placeholder in single quotes. Expressions with Date/Timestamp data type placeholders are not supported.

---

4. In the Expressions tool bar, you can also:
  - Click  button to view the Expression details.

- Click  button to view the ANSI Join details.
  - Click  button to view the Joins.
  - Click  button to view the Filters.
  - Click  button to clear the details.
5. Select **Show Advanced Options** in the Expression tool bar, and do the following:
- Click  button to and specify hints (Rules), if any. Oracle hints follow (/+ RULE \*/) format. For example, /\*+ FIRST\_ROWS(2) \*/
  - Click  button to validate the query by converting to the selected RDBMS source. If Validation is successful, the Explain Plan for the SQL query is displayed. Else, the SQL Exception is displayed.
  - Click  button to view SQL, which acts as print command for the complete query.
6. Click **OK**. The defined Expression is displayed in the *Extract Entities* grid as *Derived Column*. The specified ANSI Join or Joins, Filter, and Hints are also displayed and can be edited.
7. Click  icon in the Define Extract tool bar and save the details.







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**NOTE:** While saving the Database Extract details, the system alerts you if the mandatory properties are not specified or if the grid data is not validated.


---

8. An information dialog is displayed on completion. Click **OK**.


Map Source to Target Table in the Source-Target Mappings grid:

1. Click  icon in the Source-Target Mapping tool bar. The *DI Mapping* screen is displayed.
2. Select the **Target Infodom** from the drop down list. The source details in the selected infodom are displayed in the *Definition* pane of *Target Table Map Panel*.
3. Select the Target Table from Target Entities drop down list. The selected entities are displayed in the *Target Entities* pane of *Target Table Map Panel*. To map Source to Target, do one of the following:
  - Select a Definition and Target Entity in each column and click  button.
  - Click  button to Auto-Map the selected definitions and Target Entities.
  - You can Un-Map a definition from a Target Entity by clicking  button or Un-Map All definitions by clicking  button. You can also search for a specific definition by entering the keywords and clicking  button.
  - Click **Save** and save the mapping details.

Specify the Properties in the *Source-Target Mappings* grid.

1. Click  icon in the Source-Target Mappings tool bar. The *Properties* screen is displayed.
2. Specify the properties by entering a value or selecting an option from the drop down list.
3. In the *Hint* tool bar, specify Hints (if any), for faster loading. Oracle hints follow (/#+ HINT \*) format.

For example, /#+ PARALLEL \*/.

4. Click  icon and save the defined Database Extracts mapping details. An information dialog is displayed on completion. Click OK.

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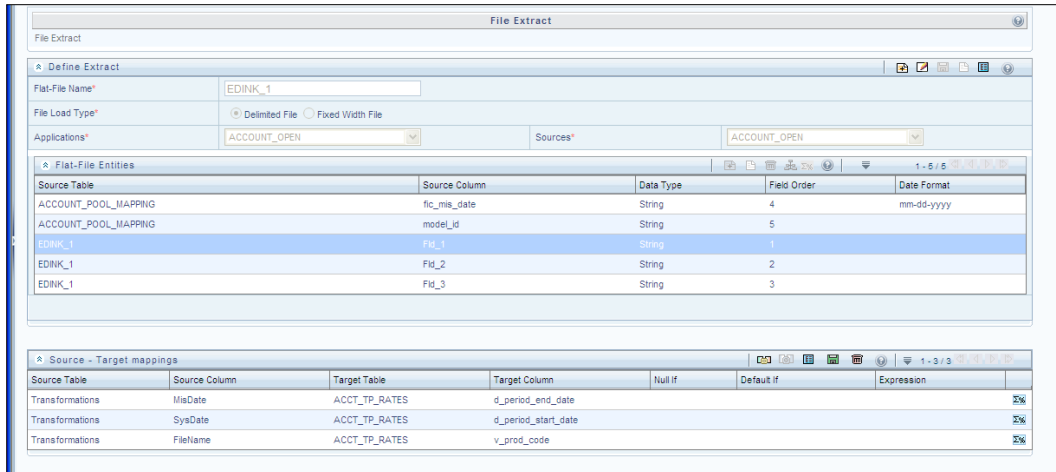
**NOTE:** A T2F definition saved with the Source to Target mappings can be used to perform F2T operations.

---

### File Extracts

File Extracts refers to the process of extracting unstructured data from a Flat File for further data processing and storage. File Extracts within the Data Integrator framework of Infrastructure system facilitates you to extract Flat File data to a Database Table. A Flat File is a text and binary file which contains data in a single line, i.e. one physical record per line. Flat Files are of two types namely, Delimited File and Fixed Width File.

- **Delimited File** refers to a Flat File in which the data is organized in rows and columns and are separated by delimiters (commas). Each row has a set of data, and each column has a type of data. For example, a csv (comma separated values) file.
- **Fixed Width** or Fixed Position File refers to a Flat File in which the data is defined by the character position (tab space). The data is formulated in such a way that the data fields are of same size and the file is compact in size. For example, the character spacing of a Birth date data column is known and hence the extra spaces between the Birth date column and other column can be eliminated.



Source Table	Source Column	Data Type	Field Order	Date Format
ACCOUNT_POOL_MAPPING	fic_mis_date	String	4	mm-dd-yyyy
ACCOUNT_POOL_MAPPING	model_id	String	5	
EDINK_1	Fld_1	String	1	
EDINK_1	Fld_2	String	2	
EDINK_1	Fld_3	String	3	

Source Table	Source Column	Target Table	Target Column	Null If	Default If	Expression
Transformations	MisDate	ACCT_TP_RATES	d_period_end_date			%
Transformations	SysDate	ACCT_TP_RATES	d_period_start_date			%
Transformations	Filename	ACCT_TP_RATES	v_prod_code			%

The *File Extracts* screen displays the list of pre-defined File Extract Mappings in the LHS menu and the options to define and Map the required Flat File to populate the required Database Table. In the *File Extracts* screen of the Warehouse Designer, you can:

- Define Flat File definition and Source Properties.
- Map the Flat File to Target model (Table) and Specify Target Properties.

## File Extraction

In the *File Extracts* screen you can **Load** file data incrementally from any RDBMS data source to a table based on certain criteria. Ensure that the ASCII file types are not loaded into the staging area using FTP which can corrupt the file causing load failure. The following steps are involved while defining File Extracts:

1. Create Flat File Definition
2. Define Flat File Properties
  - Definition (Source) properties: Specified when defining the Flat File Extracts.
  - Loading (Target) properties: Specified when mapping the Flat File Extracts.
3. Map the Flat File to the Target Model

The various sections and the available options in the *File Extracts* screen are as tabulated:

- In the *Define Extract* grid, you can define the File Extract details.
- In the *Flat-File Entities* grid, you can specify the required entities for data extraction.







## Define File Extracts and Map File to Table

You can define File Extracts such as Delimited File or Fixed Width File and Map to the required database Table. By default, the Delimited File Extract option is selected. To extract file data to table, do the following:

Source Table	Source Column	Data Type	Field Order	Date Format
STG_1_Customer	Fld_1	String	1	
STG_1_Customer	Fld_2	String	2	
STG_1_Customer	Fld_3	String	3	
STG_1_Customer	Fld_4	String	4	
STG_1_Customer	Fld_5	String	5	
STG_1_Customer	Fld_6	String	6	
STG_1_Customer	Fld_7	String	7	
STG_1_Customer	Fld_8	String	8	



Source Table	Source Column	Target Table	Target Column	Null if	Default if	Expression
No Record found						

1. Specify the File Extract details in the *Define Extract* grid.
2. Enter the **Flat-File Name**. Ensure that there are no special characters or extra spaces in the name specified.
3. Select the File Load Type as **Delimited File** or **Fixed Width File**.
4. Select the required data source **Application** from the drop down list.
5. Select the mapped **Sources** from the drop down list.
6. Select the required Entities in the *Flat-File Entities* grid. You can define the column data in either of the following ways:






7. Click  icon. Select or specify the required number of columns in the drop down list and click  button. You can double-click on any row to update the details.
8. Click  icon in the Define Entities tool bar. The **Choose Entity** screen is displayed.
  - Select the entity from Members list by clicking on the required node, and click  button.
  - You can search for a specific entity by entering the keywords and clicking  button. You can also deselect an entity by selecting from the Selected Members list and clicking  button.
  - Click **OK**. The selected source entities are displayed in the Flat File Entities grid.

The available columns in Delimited File are Source Table, Source Column, Data Type, Order, and Date Format. The available columns in Fixed Width File are Source Table, Source Column, Data Type, Order, Precision, Scale, Source Start Position, Date Format, and Length.


Specify the Source Properties in the *Define Extract* grid.


1. Click  icon in the Define Extract tool bar. The Properties screen is displayed.
2. Specify the properties by entering the required value or selecting an option from the drop down list. *Field Delimiter* and *Data File Locale* are mandatory fields for Delimited File and only *Data File Locale* is mandatory field for Fixed Width File.
3. Click  icon in the Define Extract tool bar and save the details.

Map Source to Target Table in the *Source-Target Mappings* grid.

1. Click  icon in the Source-Target Mapping tool bar. The *DI Mapping* screen is displayed.
2. Select the **Target Infodom** from the drop down list. The source details in the selected Information Domain are displayed in the Definition pane of Target Table Map Panel.
3. Select the **Target Table** from Target Entities drop down list. The selected entities are displayed in the Target Entities pane of Target Table Map Panel. To map Source to Target, do one of the following:
  - Select a Definition and Target Entity in each column and click  button.
  - Click  button to Auto-Map the selected Definitions and Target Entities.
  - You can Un-Map a Definition from a Target Entity by clicking  button or Un-Map All Definitions by clicking  button. You can also search for a specific Definition by entering the keywords and clicking Search icon or click Add icon to create an expression to join column data in the *Specify Expression* screen.
  - Click **Save** and save the mapping details.

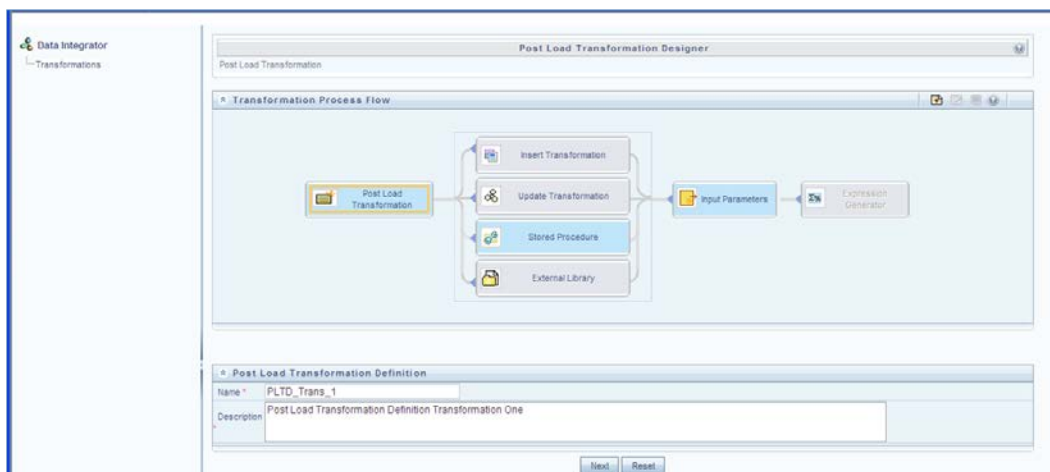
Specify the Target Properties in the Source-Target Mappings grid:

1. Click  icon in the Source-Target Mappings tool bar. The *Properties* screen is displayed.

2. Specify the properties by entering the required value or selecting an option from the drop down list.
3. Click  icon and save the details.

## Post Load Transformation

Transformation refers to a rule describing the conversion of source data from source to the destination. During the data extraction, a transformation rule facilitates in structuring the required data from sources to the target or an intermediate systems for further processing. Based on the selected mode, transformations can be applied to execute the process successfully. For example, an SQL rule with the “SELECT” statement can retrieve source data from specific table(s). Post Load Transformation within the Data Integrator framework of Infrastructure system facilitates you to define transformations to the source data before extracting/loading it to Target database to populate the data warehouse.









The Post Load Transformation Designer screen displays the list of pre-defined Transformations in the LHS menu and the Transformation Process Flow to help you navigate and define Post Load Transformations. The Post Load Transformation Designer screen facilitates you to create, update, and delete the following transformations:

- Insert/Update Transformation
- Stored Procedure Transformation
- External Library




### *Insert/Update Transformation*

Insert/Update Transformation facilitates you to define transformation parameters, create expression with source, destination, and join/filter conditions, add transformation logic, and query the SQL Rule generated. To Insert or Update Transformation in the in the *Post Load Transformation Designer* screen:

1. Click  icon in the Transformation Process Flow tool bar.
2. In the *Post Load Transformation Definition* grid.
  - Enter the **Transformation Name**. Ensure that there are no special characters or extra spaces in the name specified.
  - Enter a **Description** for the transformation.

- Click **Next** and save the details. You are automatically navigated to the Insert Transformation section. For Update Transformation, click **Update Transformation** in the *Transformation Process Flow* grid.
3. Click  icon in the Parameter Definition tool bar. A new row is inserted and allows you to define the run-time parameters to the transformation.
    - Double-click on the **Parameter Name** and enter the details.
    - Double-click and select the required **Data Type** from the list.
    - Double-click on the **Default Value** and enter the details.
    - Click **Next** and save the parameter details. You are also navigated to the Expression Generator section.
  4. In the Expression Generator grid, specify the Source and Destination Entity by doing the following:
    - Click  icon. The *Choose Entity* screen is displayed.
    - Select the entity from Members list by clicking on the required node, and click .
    - You can search for a specific entity by entering the keywords and clicking the  icon. You can also deselect an entity by selecting from the Selected Members list and clicking .
    - Click **OK**. The selected source entities are displayed in the Define Entities grid.
  5. Specify the Join/Filter Condition. Click Select icon and define the expression in the *Specify Expression* screen. Click **OK**.
 


You can also:




    - Click  icon and include the Transformation parameter conditions in the *Transformation Logic* grid or click  icon to define an expression.
    - Click  icon to generate Logic and view the SQL query in the *Query Generated* grid.
    - Click **Check Syntax** to check the syntax of the query generated.
  6. Click **Finish** and save the Insert or Update Transformation details.

The Transformation details are added to the list in LHS menu and a confirmation dialog is displayed. Click **OK**. You can load the transformation by double-clicking in LHS menu to view or edit.

### ***Stored Procedure Transformation***

Stored Procedure Transformation facilitates you to define complex transformations involving multiple tables which are contained in a pre-defined stored procedure. To define a Stored Procedure Transformation in the *Post Load Transformation Designer* screen:

1. Click  icon in the Transformation Process Flow tool bar. In the *Post Load Transformation Definition* grid.
  - Enter the **Transformation Name**. Ensure that there are no special characters or extra

- spaces in the name specified.
  - Enter a **Description** for the transformation.
  - Click **Next** and save the details. You are automatically navigated to the *Insert Transformation* section.
2. Click **Stored Procedure** in the Transformation Process Flow grid.
  3. Click  icon in the Parameter Definition tool bar. A new row is inserted and allows you to define the run-time parameters to the transformation.
    - Double-click the **Parameter Name** and enter the details.
    - Double-click and select the required **Data Type** from the list.
    - Double-click on the **Default Value** and enter the details.
  4. Click **Browse** in the Stored Procedure Editor tool bar and navigate to the file path containing the stored procedure. You can select either a text file or HTML file. You can click  icon in the Stored Procedure Editor tool bar to **Check Syntax** of the stored procedure. You can upload a *Business Process Flow* diagram corresponding to the selected Stored Procedure Transformations in jpg, png, gif, or vsd format.
    - In the Business Process Flow grid, click **Browse** and locate the file path.
    - Click  icon in the Business Process Flow tool bar and upload the file.


Once uploaded, the Upload Status changes to “Yes” and a hyperlinked image icon is displayed to view the Business Process Flow diagram in the *Post Load Transformation Designer* screen. You can also view the uploaded Business Process Flow diagram from the *Metadata Browser > Data Transformations* screen.

5. Click **Finish** and save the Stored Procedure Transformation details.


The Transformation details are added to the list in LHS menu and a confirmation dialog is displayed. Click **OK**. You can load the transformation by double-clicking in LHS menu to view or edit.

### **External Library**

External Library consists of built-in functions/procedures and facilitates you to define complex SQL Rule Transformations which are compiled and stored as an executable file. You can load the External Library procedures and functions using the transformation wizard. To define External Library Transformation in the *Post Load Transformation Designer* screen:

1. Click  icon in the Transformation Process Flow tool bar.
2. In the *Post Load Transformation Definition* grid:
  - Enter the **Transformation Name**. Ensure that there are no special characters or extra spaces in the name specified.
  - Enter a **Description** for the transformation.
  - Click **Next** and save the details. You are automatically navigated to the Insert Transformation section.
3. Click **External Library** in the *Transformation Process Flow* grid.



4. Click  icon in the Parameter Definition tool bar. A new row is inserted and allows you to define the run-time parameters to the transformation.
  - Double-click on the **Parameter Name** and enter the details.
  - Double-click and select the required **Data Type** from the list.
  - Double-click on the **Default Value** and enter the details.
5. In the External Library Details grid, enter the **Name** of executable library file (**.sh file**) located in default figdb/bin path. You can also specify the path till the file name.
6. Click **Finish** and save the External Library Transformation details.

The Transformation details are added to the list in LHS menu and a confirmation dialog is displayed. Click **OK**. You can load the transformation by double-clicking in LHS menu to view or edit.

### 2.3.2 Data Entry Forms and Queries

Data entry Forms and Queries (DEFQ) within the Infrastructure system facilitates you to design web based user-friendly Data Entry screens with a choice of layouts for easy data view and data manipulation. DEFQ consists of the following sections. Click the links to view the sections in detail.

- Forms Designer
- Forms Authorization
- Data Entry
- Excel Upload

#### Forms Designer

Forms Designer within the Data Entry Forms and Queries section facilitates you to design web based user-friendly Forms using the pre-defined layouts. The *DEFQ - Forms Designer* screen displays a list of pre-defined options to create, modify, and delete Forms. You can also assign rights and define messages. By default, the option to *Create a New Form* is selected and the left pane indicates the total steps involved in the process. The available options are as indicated below. Click on the links to view the section in detail.

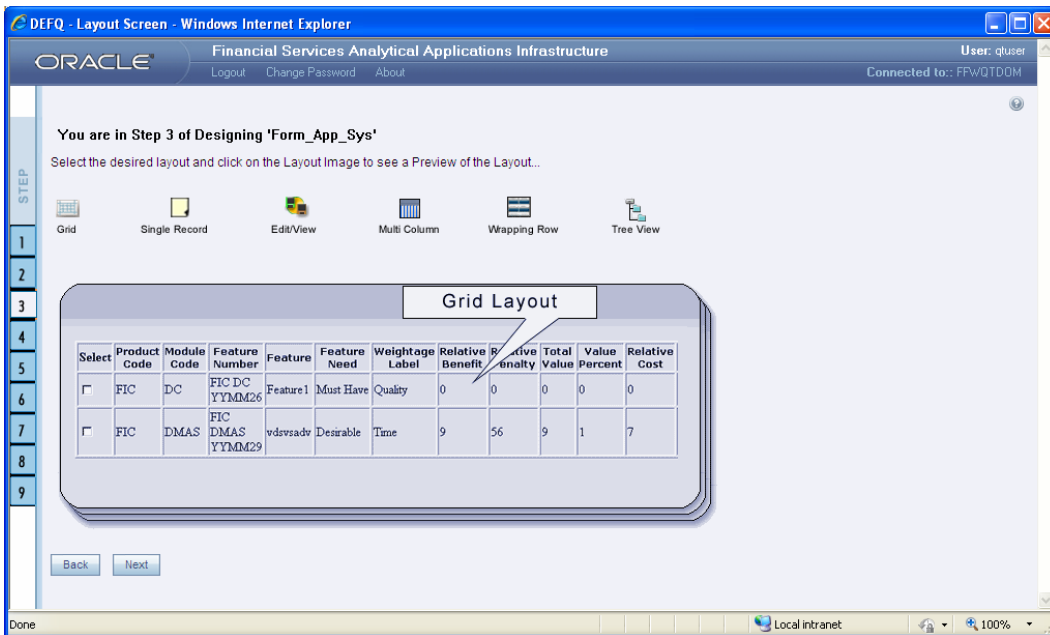
- Create a New Form
- Alter Existing Forms
- Copy Forms
- Delete Forms
- Assign Rights
- Message Type Maintenance

#### *Create a New Form*

To design a new form in the *DEFQ - Forms Designer* screen:

1. Ensure that **Create a New Form** option is selected and do the following:
  - Specify the application name by either entering the **New Application Name** or selecting **Available Applications** from the drop down list.
  - Enter the **New Form Name**.



- Click **Next**. The *DEFQ - Layout Screen* is displayed with the range of pre-defined layouts for you to choose.





Refer to the following table for information.

Layout	Description
<b>Grid Layout</b>	It is the default layout which displays the records in the Form of a table/grid with multiple rows of data.
<b>Single Record Layout</b>	It displays a single record at a time.
<b>Edit/View Layout</b>	It is a combination of the Single Record and Grid layout. By selecting a record in the grid, the record is displayed in a single record format, which is editable. By default the first record will be displayed in the editable grid. <b>Note:</b> The column names are editable only during altering the created Form.
<b>Multi Column Layout</b>	It displays a single record with its column in a grid format. You can view a multi column layout Form without having to scroll or with minimum scrolling to view all the columns.
<b>Wrapping Row Layout</b>	It displays rows of a single record in a wrapped manner in a grid format. You can view a wrapping row layout Form easily without having to scroll horizontally to view all the data.

Layout	Description
Tree View Layout	<p>It displays the Hierarchical dimensional table with the selected dimension details. You can select the following options:</p> <ul style="list-style-type: none"> <li>▪ Dimensional Table Tree</li> <li>▪ Parent Child Tree</li> </ul> <p><b>Note:</b> The process to create a Form using the Tree View Layout differs from the procedure explained below.</p>

3. Select the required layout and click **Next**. The *List of Available Tables* is displayed.
4. Select the required Table from the list on which the Form is to be created. For multiple selections, you can either press **Ctrl** key for nonadjacent selection or **SHIFT** key for adjacent selections. Click **Next**, the *Fields Selection Screen* is displayed. If multiple tables are selected, you need to specify Equi-Join Condition(s). Select the *Table* from the drop down list and select the *Available Fields*. Specify the join condition. Click **Next**, the join conditions are validated and *Fields Selection Screen* is displayed.
5. Select the fields to be joined from the **Available Fields** list and click . You can press **Ctrl** key for multiple selections and also click  to select all the listed fields. All mandatory fields are auto selected and are indicated on screen with an asterisk (\*).



---

**NOTE:** You can click  or  buttons to arrange the fields in the required order as intended to display in the Data Entry Form. The fields order need not be similar to the arrangement in the underlying table.

---

6. Click **Next**. The *Sort Fields Selection Screen* is displayed.

You can sort the fields in required order as intended to display in the Data Entry Form. Also the mandatory fields which needs user inputs are indicated in '\*' symbol and are auto selected in the Selected Fields pane.

- Select the field from the **Available Fields** list click . You can press **Ctrl** key for multiple selections and also click  to select all the listed fields.
- (Optional) To arrange multiple fields, select **Sort by Descending** checkbox.
- (Optional) Select the **Excel Map** checkbox to enable *Bulk Authorization*.

---

**NOTE:** In case you have selected **Excel Map** checkbox, you need to select "Excel Name" from the **Store Field As** list in the *DEFQ Field Properties* screen. Only on selection, the "SelectExcelSheetName" list is displayed for authorizer in the *DEFQ - Data Entry* screen.

---

7. Click **Next**. The *DEFQ Field Properties* screen is displayed with the Form details such as Field Name, Display Name, In View, In Edit/Add, Allow Add, Store Field as, Rules, and Format Type.

**Form\_App\_Sys** - Table Name : BUSINESSLINE\_LOCATION

Number of Rows to be displayed: 5 | Page Size: 20

Batch Commit | Message Details | Form Filter | Data Versioning

Field Name	Display Name	In View	In Edit or Add	Allow Add	Store Field as	Rules	Format Type
HREF001*	HREF001	Display	Text Field	<input checked="" type="checkbox"/>	Normal	Rules	None
HREF002*	HREF002	Display	Text Field	<input checked="" type="checkbox"/>	Normal	Rules	None
LOCALE*	LOCALE	Display	Text Field	<input checked="" type="checkbox"/>	Normal	Rules	None
UK_HREF001*	UK_HREF001	Display	Text Field	<input checked="" type="checkbox"/>	Normal	Rules	None
UK_HREF002*	UK_HREF002	Display	Text Field	<input checked="" type="checkbox"/>	Normal	Rules	None
VERSION_NO*	VERSION_NO	Display	Text Field	<input checked="" type="checkbox"/>	Normal	Rules	None

Buttons: Back | Save | Save with Authorization

8. Specify the parameters for each field as tabulated.

Field	Description
Display Name	Edit the default Display Name if required.
In View	<p>Select either Display or Do not Display to display the field in the Form.</p> <p>If the field is a foreign key field or if more than one table is selected, then the following options are available in the drop down list;</p> <ul style="list-style-type: none"> <li>Same Field</li> <li>Alternate Display Field</li> <li>Do not Display options</li> </ul>
In Edit/Add	<p>Specify the edit parameters by selecting from the drop down list. The available options depend on the type of field selected.</p> <ul style="list-style-type: none"> <li>For normal fields you can select Text Field, Text Area, Select List, Protected Field, Read Only, and Do Not Show.</li> <li>For foreign key fields you can select Read Only, Select List, and Do Not Show.</li> <li>For primary key fields you can select Read Only and Do Not Show.</li> <li>For calendar fields you can select Calendar and Do Not Show.</li> </ul> <p><b>Note:</b> If you choose <b>Select List</b> option, you need to define the values.</p>
Allow Add	<p>Select the checkbox to permit users to add new record.</p> <p><b>Note:</b> An alert message is displayed if you are trying to save a Form with add option disabled for the mandatory fields.</p>

Field	Description
Store field as	Select the required option from the drop down list. You can select the store format as Normal, Sequence Generator, Maker Date, Checker Date, Created Date, Modified Date Auth Flag, Maker id, Maker Date, Checker id, Checker Date, Checker Remarks, Maker Remarks, and Excel Name (If Excel Map is selected in <i>Sort Fields Selection</i> screen).
Rules	Click <b>Rules</b> and specify Rules and Expressions for the selected field in the <i>Specifying Rules and Expressions for Data - Validations</i> screen.
Format Type	Select the required Format type from the drop down list depending on the field type selected.
Batch Commit	Select the checkbox to group all the set of table Forms to a batch. All the Form tables are executed along with the batch execution and if in case, a Form in the table fails to execute, the entire set of Forms are returned.
Message Details	Click <b>Message Details</b> to define the message type for Creator and Authorizer in the <i>Messaging Details for a Form</i> screen.
Form Filter	Click Form Filter to define an expression for Form-level filter condition in the <i>Filter for Form</i> screen.
Data Versioning	Click <b>Data Versioning</b> to perform data versioning on an authorized Form.

- Click either **Save** to only save the Form details or click **Save for Authorization** to save the changes with authorization.

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**NOTE:** Sometime, on clicking **Save**, the form does not get saved. This is because the Java heap size setting for OFSAAI service is set too high and web server memory setting is too low. Contact System Administrator to modify it to the appropriate setting by viewing the log file created in the path: \$FIC\_APP\_HOME/common/FICServer/logs/.




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




While saving, the *User for Mapping - DEFQ* screen is displayed which facilitates you to assign user rights to the Form.

### **Alter Existing Forms**

To alter the field details of an existing Form in the *DEFQ - Forms Designer* screen:

- Select **Alter Existing Forms** from the available options and do the following:
  - Select the **Available Applications** from the drop down list.
  - Select the **Available Forms** from the drop down list. The listed Forms are dependent on the DSN (Data Source Name) that you have specified.
- Click **Next**. The *Fields Selection Screen* is displayed. **Add** or **remove** the selected fields as required to be displayed in the Form. You can choose a field from the **Available Fields** list and click  to add, or choose the selected field from the **Fields to Display** list and

click  to de-select. You can press **Ctrl** key for multiple selections and also click  or  buttons to select/de-select all the listed fields.

3. Click **Next**. The *Sort Fields Selection Screen* is displayed.
  - Sort the fields in required order as intended to display in the Form. You can choose a field from the list and click  or  buttons to select/deselect. You can also click  or  buttons to select/de-select all the listed fields.
  - Select a field and click  or  buttons to arrange fields in the required order.
  - (Optional) To arrange multiple fields, select **Sort by Descending** checkbox.
  - (Optional) Select the **Excel Map** checkbox to enable *Bulk Authorization*.

---

**NOTE:** In case you have selected **Excel Map** checkbox, you need to select “Excel Name” from the **Store Field As** list in the *DEFQ Field Properties* screen. Only on selection, the “SelectExcelSheetName” list is displayed for authorizer in the *DEFQ - Data Entry* screen.

---

4. Click **Next**. The *DEFQ Field Properties* screen is displayed.
5. Modify the parameters for each field as required.
6. Click either **Save** to save the Form details or click **Save for Authorization** to save the changes with authorization. While saving, the *User for Mapping - DEFQ* screen is displayed which facilitates you to assign user rights to the Form.

### **Copy Forms**

You can duplicate and recreate a form with the required variants from an existing form. You can also change user rights or display options and other subtle variations for the selected layout. To Copy a Form in the *DEFQ - Forms Designer* screen:

1. Select **Copy Forms** from the available options and do the following:
  - Select the application from the **From Application** drop down list which consist of the required Form which you want to copy.
  - Select the application from the **To Application** drop down list for which you want to copy the Form.
  - Select the required Form from the **Save Form** drop down list.
  - Enter a name for the Form in the **As Form** field.
2. Click **Next**. The specified Form is duplicated as a new Form and a confirmation dialog is displayed with the status.

### **Delete Forms**



You can remove the forms which are not required in the system by deleting from the *DEFQ - Forms Designer* screen.

1. Select **Delete Forms** from the available options and do the following:
  - Select the application from the **Available Application** drop down list which consist of the required Form which you want to delete.
  - Select the Form from the **Available Forms** drop down list which you want to delete.

2. Click **Next**. An information dialog is displayed for confirmation. Click **OK**.

### ***Assign Rights***

You can assign user permissions to view, add, edit, and delete the Form details in the *User for Mapping - DEFQ* screen.

1. Select **Assign Rights** from the available options and do the following:
  - Select the required application from the **Available Application** drop down list.
  - Select the Form from the **Available Forms** drop down list.
2. Click **Next**. The *User for Mapping - DEFQ* screen is displayed.
3. Select the required user from the **Available User List**. You can also click  or  buttons to reload previous/next set of users in the list.
4. Select the checkbox adjacent to the listed user permissions such as View, Add, Edit, Delete, or All Above. You must select view option in order to allow users to Edit or Delete a Form.
5. Select **Authorize** or **Auto-Authorize** checkbox as required. The **Authorize** and **Auto-Authorize** options are applicable for all the forms that have been saved with the Authorize option. The **Auto-Authorize** feature for records is applicable in scenarios where the Creator and Authorizer are the same. If a user has **Add** and **Auto-Authorize** grants, the data entered by the user is auto authorized and the data is in **Authorized** status. In case of normal Authorization, the Record added by the creator has to be authorized by a different user who has **Authorize** permissions.

---

**NOTE:** The **Auto-Authorize** feature in Forms Designer is applicable only for data entered through *Data Entry* screen and not through *Excel Upload* screen.

---

You can also select the checkbox to **Show Data Created by Current Users Only**.

6. Click **Save Access Rights**. A confirmation dialog is displayed after saving and the user is added to the **Assigned User List**.

### ***Message Type Maintenance***

You can manage the Message Type details which alert the Creator of the Form or to an Authorizer in the *DEFQ Message Type Maintenance Screen*. Message Type details can be defined while creating a Form. In the *DEFQ - Forms Designer* screen, do the following:

1. Select **Message Type Maintenance** from the available options and click **Next**. The *DEFQ - Message Type Maintenance Screen* is displayed.
2. Select the message category from the **Message Type** drop-down list.
3. Edit the message details by doing the following:
  - The defined **Message Subject** and **Message Content** is auto populated. Edit the details as required.
  - Add or remove the defined recipients. Double-click on the required member to toggle between **Available** and **Mapped Recipients** list.

---

**NOTE:** Selecting Authorizer alerts all the selected authorizers for authorization.

---

4. Click **Save**. A confirmation is displayed on updating the *Message Type* details.

## Forms Authorization

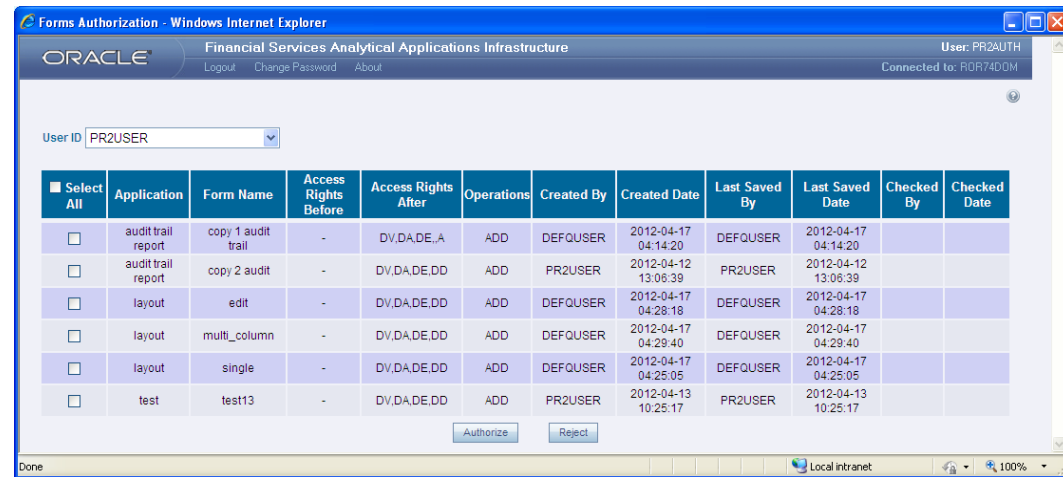
Forms Authorization within the Data Entry Forms and Queries section of the infrastructure system facilitates you to view and authorize / approve any changes that are made to the privileges assigned to a user in a particular form. You need to have **FRMAUTH** function role mapped to access *Forms Authorization* screen.

---

**NOTE:** You cannot authorize or reject a right request created by you, even if you have **FRMAUTH** function role mapped.

---

You can access *Forms Authorization* screen from the left hand side (LHS) menu of Infrastructure home page. Click “+” and expand the Unified Metadata Manager and select **Data Entry Forms and Queries**.



The *Forms Authorization* screen displays the list of privileges assigned to a user in different Forms. These privileges include create, view, modify, delete, authorize, and auto-authorize records. The *Forms Authorization* screen allows you to select a user from the drop down list adjacent to **User ID** field. This field displays the User ID's associated with the selected Information Domain. On selecting a user from the **User ID** field, the columns in *Forms Authorization* screen lists the grants requested for that user on different Forms as listed below.

Column Name	Description
Application	Lists the specific application to which the Form has been assigned.
Form Name	Displays the Form Name.
Access Rights Before	Displays the available Right Requests for the selected user in the Form. <i>Note: For new Form, the column remains blank.</i>



Column Name	Description
Access Rights After	Displays the Right Requests raised for authorization.  <b>DV</b> - DEFQ VIEW  <b>DA</b> - DEFQ ADD  <b>DE</b> - DEFQ EDIT  <b>DD</b> - DEFQ DELETE  <b>A</b> - AUTHORIZE  <b>DU</b> - AUTO AUTHORIZE  <b>S</b> - SHOW DATA CREATED BY CURRENT USER ONLY
Operations	Displays the operation carried out in the Form.  For example, “ <b>ADD</b> ” indicates a new form is created and specific roles are assigned.
Created By	Displays the USER ID from which the Right Request has been created.
Created Date	Displays the Date on which the Right Request has been created.
Last Saved By	Displays the USER ID from which the previous Right Request change has been saved.
Last Saved Date	Displays the Date on which the previous Right Request change has been saved.
Checked By	Displays the USER ID from which the Right Request has been authorized.
Checked Date	Displays the Date on which the Right Request has been authorized.

To authorize or reject a form in the *Forms Authorization* screen:

1. Select the User ID from the drop down box. The Right Requests submitted on various forms are displayed.
2. Select the checkbox(s) adjacent to the requests to authorize / reject. You can also select all the requests at once for a user, by clicking **Select All** checkbox.
3. Click **Authorize / Reject** to authorize or reject the selected Right Requests.

Once form action privileges are authorized, those actions can be performed on the form. For an existing Form with certain rights, the rights remain the same until the changes are authorized / rejected by an authorizer.

## Data Entry

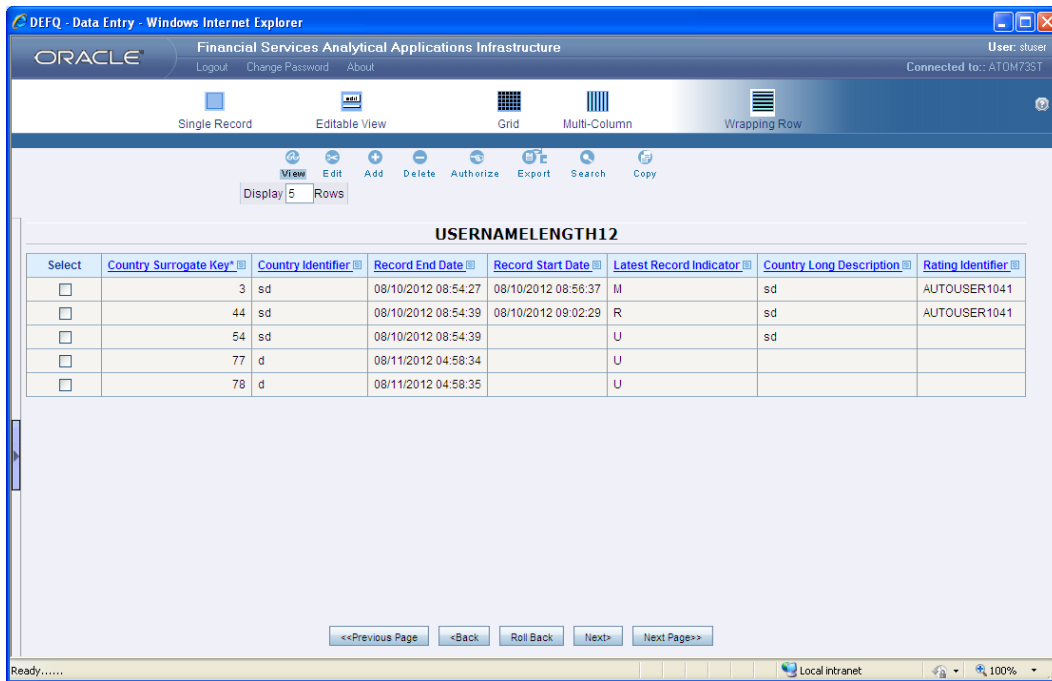
Data Entry within the Data Entry Forms and Queries section of infrastructure system facilitates you to view, add, edit, copy, and delete data using the various layout formats and Authorize/Re-authorize data records based on the permissions defined during the form creation. You can use the Search option to query the records for specific data and also export the data in Microsoft Excel format for reference. You can launch multiple instances of Data Entry screen using the URL to search and update records simultaneously.

You (Business Analysts) need to have DEFQMAN function role mapped to access the DeFQ framework. You can access DEFQ - Data Entry by expanding Data Entry Forms and Queries section of Unified Metadata Manager module within the tree structure of LHS menu.

---

**NOTE:** An alert message is displayed if you are not mapped to any Forms in the system.

---



The *DEFQ - Data Entry* screen displays the list of Data Entry Forms and Query Forms mapped to the logged-in user in the LHS menu. You can select the required Form to view the details. In the *DEFQ - Data Entry* screen, you can do the following:

- View Form Details
- Edit Form Details
- Add Form Data
- Authorize Records
- Export Form Data
- Copy Form Data
- Delete Form Details

### **View Form Details**

The *DEFQ - Data Entry* screen displays the selected Form Data in the View mode by default. The Forms are displayed based on the application names in the LHS menu. There are various layouts available to customize the view and by default, the Form details are displayed in the layout in which it was designed.

In the *DEFQ - Data Entry* screen, the following layout types are available. You can click on any of the following layouts to view the Form details. The buttons i.e. **Previous Page**, **Back**, **Next**, and **Next Page** helps you to navigate through the records.

---


**NOTE:** The **Roll Back** option can be used only for authorized records i.e. after the records are edited and saved, you can roll back/undo the changes in view mode.

---


Layout	Description
<b>Single Record</b>	To view a single record details at any given point. You can use the navigation buttons to view the next record in the table.
<b>Editable View</b>	To view and edit a single record. A list of five rows/records is displayed by default, and the same can be changed by entering the required number in <b>Display Rows</b> . You need to select the required record from the list to view/edit and click <b>Save</b> to update the changes.
<b>Grid (Default)</b>	To view all the records in a list. A list of five rows/records is displayed by default, and the same can be changed by entering the required number in <b>Display Rows</b> . You can click on the column header to alphabetically sort the list of records in the table.
<b>Multi column</b>	To view all the columns of a selected record. This layout enables you to view a record without having to scroll or with minimum scrolling to view all the columns.
<b>Wrapped rows</b>	To view all the rows of a selected record. This layout enables you to view a wrapping row easily without having to scroll horizontally to view the columns.

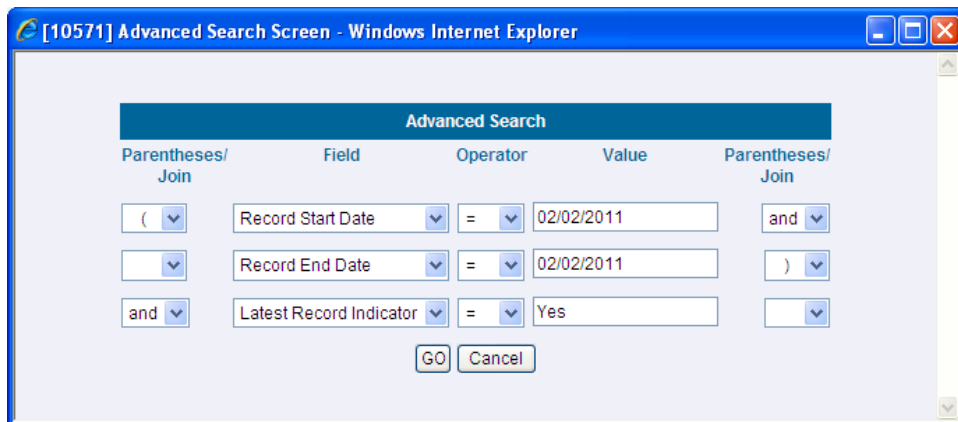
**Search Records**

In the *DEFQ - Data Entry* screen, you can Search for a record in the View, Edit, and Authorize modes. You can perform a quick **Search** to find a specific record or run an **Advanced Search** to further query the record for the required details. To search for a record in the *DEFQ - Data Entry* screen:

1. Click . The search fields are displayed.
2. Select **Field Name** from the drop down list.
3. Enter the **value/data** in the Search field.
4. Click **Go**. The search results are displayed in the list.

To perform an **Advanced Search** in the *DEFQ - Data Entry* screen:


1. Click  within the Search fields. The *Advanced Search Screen* is displayed.



2. Select the required Parentheses/Join, Field, Operator from the drop down list and enter the Value as required to query the Form data.
3. Click **GO**. The results are displayed with the field names containing the searched data.

### ***Edit Form Details***


You can edit the permitted Form field values in the *DEFQ - Data Entry* screen. However, you cannot modify the primary key fields which are displayed in non editable format. To edit Form Details in the *DEFQ - Data Entry* screen:

1. Open the required Form in view mode and click  **Edit**. The editable fields are enabled.
2. Enter/update the required details.
3. Click **Save** and update the changes. If required, you can click **Reset** to undo the changes and return to original field values.

If you have edited an Authorized record, the same is again marked for authorization. Once the record is updated, a modified status flag is set, and only these record changes can be rolled back. The Roll Back option is supported in view mode only for authorized records, i.e. records which are updated and saved.

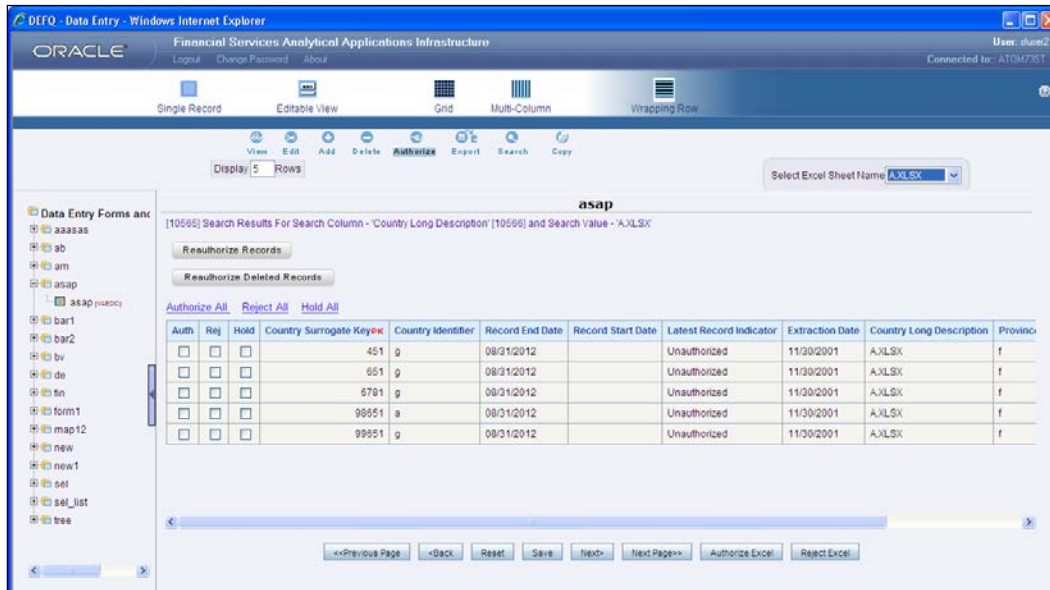
### ***Add Form Data***

You can add a row to the required table and enter the field details. To Add Form Data in the *DEFQ - Data Entry* screen:

1. Open the required Form in view mode and click  **Add**. By default, five rows are displayed. You can modify by specifying the number of required rows in **Display Rows** field and clicking **Reset**.
2. Enter the required numeric data in the new fields. If you want to view the numeric data separated by commas, enter the details accordingly.
3. Click **Save** and update the data to the selected table.

### ***Authorize Record***


You need to have DEFQMAN and SYSAUTH function roles mapped to access and authorize Forms in the DeFQ framework. You can Authorize a single record or all the records of a selected Form with the in the *DEFQ - Data Entry* screen. You can authorize record in a table which has a primary key field. A primary key field in the record is indicated by “**PK**”. You need to have the authorization rights defined by the user who has created the record. You can also Reject or Hold inappropriate records in the table.



The status of each record in the table is indicated with an “AuthFlag” as indicated below:

- **Unauthorized** records are displayed with the status flag “**U**”
- **Authorized** records are displayed with the status flag “**A**”.
- **Rejected** records are displayed with the status flag “**R**”.
- **Modified** records are displayed with the status flag “**M**”.
- **Deleted** records are displayed with the status flag “**D**”.
- If an **Unauthorized** record is on **Hold**, the status flag is displayed as “**H**”.
- If a **Modified** record is on **Hold**, the status flag is displayed as “**X**”.
- If a **Deleted** record is on **Hold**, the status flag is displayed as “**Z**”.

To Authorize Data in the *DEFQ - Data Entry* screen:

1. Open the required Form in view mode and click  **Authorize**. The list of available records for Authorization is displayed. If there are “no records” for Authorization in the selected Information Domain, an alert message is displayed.
2. Select the “Auth” checkbox adjacent to the required record with the status flag “**Unauthorized / Put On Hold**” and click **Save**. A confirmation dialog is displayed. Click **OK**. You can also do a **Bulk Authorization** if Excel Map is selected in the *Sort Fields Selection* screen. Select the mapped Excel Name from the “Select Excel Sheet Name” drop down list. The *DEFQ - Data Entry* screen displays only those records which are uploaded though the selected Excel sheet. Click **Authorize Excel**. A confirmation dialog is displayed. Click **OK**.

You can reject / hold a record by doing the following:

- To **reject** a record, select the checkbox in the “**Rej**” column adjacent to the required record and click **Save**. A confirmation dialog is displayed. Click **OK**. You can also reject records in Bulk Mode if Excel Map is selected in the *Sort Fields Selection* screen. Select the mapped Excel Name from the “Select Excel Sheet Name” drop down list. The *DEFQ*

- *Data Entry* screen displays only those records which are uploaded through the selected Excel sheet. Click **Reject Excel**. A confirmation dialog is displayed. Click **OK**.

- To **Hold** a record and to authorize or reject at a later point, select the checkbox in the “**Hold**” column adjacent to the required record and click **Save**.

In the *DEFQ - Data Entry* screen, you can also do the following:

- Click **Authorize All** and click on **Save** to authorize all the records displayed in current page.
- Click **Reject All** and click on **Save** to reject all the records displayed in current page.
- Click **Hold All** and click on **Save** to hold all the records displayed in current page.

If you have enabled the option to send alerts to the Creator of the Form in *Message Type Maintenance* screen, a message is sent indicating that the records are authorized/rejected/put-on-hold.

### Re-authorize Records


You can re-authorize an authorized record which has been updated by other users. When an authorized record is updated, the status flag (AuthFlag) is set to “M” indicating that the record has been modified and needs re-authorization.

**Modified Record Authorization :**

Auth	Rej	Hold	Extraction Date	Currency Code	Surrogate Key	Currency Code	Record End Date	Record Start Date	Latest Record Indicator	Local Currency Indicator	Reporting
Edited Data :											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	06/29/2011 14:52:08		666 3		06/11/2010 10:10:16	06/29/2011 14:52:08	8		Modified
Original Data :											
			06/29/2011 14:52:08		666 3		06/11/2010 10:10:16	06/29/2011 14:52:08	8		Modified

Navigation buttons: <<Previous Page, <Back, Reset, Close, Save, Next, Next Page>>

To re-authorize modified records in the *DEFQ - Data Entry* screen:

1. Open the required Form in view mode and click  **Authorize**. The list of available records with the Authorization status is displayed. If there are “no records” for Authorization in the selected Information Domain, an alert message is displayed.
2. Click **Reauthorize Records**. The *DEFQ Authorization Window* is displayed.
3. Select the “Auth” checkbox adjacent to the required record.
4. Click **Save**. On re-authorization, a confirmation message is displayed. You can also select the checkbox adjacent to “Rej” to reject the record, or “Hold” to re-authorize or reject at a later point. A message is sent to the Form creator indicating that records are authorized/rejected/put-on-hold.

### Re-authorize Deleted Records


You can re-authorize the delete action when an authorized record has been deleted by other users. When an authorized record is deleted, the status flag (AuthFlag) is set to “D” indicating that the record has been deleted

and needs re-authorization.



Auth	Rej	Hold	Extraction Date	Currency Code	Surrogate Key	Currency Code	Record End Date	Record Start Date	Latest Record Indicator	Local Currency Indicator	Reporting
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	06/29/2011 14:52:08		990	45		07/23/2009 14:22:25	U		Deleted


To re-authorize deleted records in the *DEFQ - Data Entry* screen:

1. Open the required Form in view mode and click  **Authorize**. The list of available records with the Authorization status is displayed. If there are “no records” for Authorization in the selected Information Domain, an alert message is displayed.
2. Click **Reauthorize Deleted Records**. The *DEFQ Authorization Window* is displayed.
3. Select the “Auth” checkbox adjacent to the required record.

Click **Save**. On re-authorization, a confirmation message is displayed. You can also select the checkbox adjacent to “Rej” to reject the record, or “Hold” to re-authorize or reject at a later point. A message is sent to the Form creator indicating that records are authorized/rejected/put-on-hold.


### Export Form Data

You can export the required record(s) to a selected location in CSV format. To Export Form Data in the *DEFQ - Data Entry* screen:

1. In the View mode, select the checkbox adjacent to the record(s) which you want export.
2. Click  **Export**. The *File Download* dialog is displayed.
3. Click **Save**. The *Save As* dialog is displayed.
4. Select the location and click **Save**. The selected record is exported.


### Copy Form Data

You can copy the existing fields and create new fields in a record. When you copy a field, the primary key values are incremented from the pre-defined value to the next acceptable value. However, the other fields can be modified as required. To copy fields in the *DEFQ - Data Entry* screen:

1. Open the required Form in view mode and click  **Copy**. The list of available records is displayed. All the primary field data (indicated by \*) is incremented by default.
2. Click **Save**. The field values are added to the record. You can click **Edit** to modify the values or click **Next** to copy the next set of fields.

### **Delete Form Details**

You can remove a Form details which are no longer required by deleting from the *DEFQ - Data Entry* screen.

1. In the View mode, select the checkbox adjacent to the record which you want to delete.
2. Click . An information dialog is displayed.
3. Click **OK** to confirm and delete the record.

### **Excel Upload**

Excel Upload utility facilitates you to upload excel data sheets to specific destination table and map the table's columns with the columns in MS Excel. In order to view the Excel Upload utility within the Infrastructure system, you need to manually copy the “.ssh” folder from the Application layer to the Web Server area after the OFSAAI installation. Contact System Administrator for more information.

Excel Upload supports excel files created in Microsoft 2007 along with the earlier versions. Also you can map and upload multiple sheets created within a single excel file. The Excel Entity Mappings and Upload utilities have the restricted access depending on the following function roles mapped:

- Users with XLADMIN and XLUSER function roles can perform both mapping and upload operations.
- Users with XLADMIN function role can only define mapping and authorize, but cannot upload the file.
- User with “XLUSER” function can only retrieve mapping definition (pre-defined by XLADMIN user) and can upload the file based on retrieved mapping.

You can access DEFQ - Excel upload by expanding Data Entry Forms and Queries section of Unified Metadata Manager module within the tree structure of LHS menu. The *DEFQ - Excel Upload* screen displays the Excel-Entity Mappings and Excel Upload options in the LHS menu. Click on the links to view the section in detail.


- Excel-Entity Mappings
- Excel Upload

### **Excel-Entity Mappings**

Excel-Entity Mapping helps you to map Excel Data to the destination table in the database. Excel-Entity Mapping supports excel files created in Microsoft 2007 and earlier versions along with the option to map and upload multiple sheets created within a single excel file. You need to have XLADMIN function role mapped in order to define mapping.

### **Add Excel-Entity Mappings**

To define mapping in the *Excel-Entity Mappings* screen:

1. Click Add icon in Mappings Summary tool bar. The *ADD Excel-Entity Mappings* screen is displayed.
2. Enter the required **Mapping Name** and **Description**.
3. Click **Browse**. The *Choose File to Upload* dialog is displayed. Select the required Excel and click  button.

On upload, the selected Excel columns are listed in *Select Excel Columns* grid and the database tables are listed in *Select Entities* grid.



Excel Fields	Field Order	Date Format	Destination table	Destination column
<input type="checkbox"/> Field1	1	-	COM_ENTITY_GROUP_MAP	f_dim_fact_flag
<input type="checkbox"/> Field2	2	-	COM_ENTITY_GROUP_MAP	n_mismatch_rows
<input type="checkbox"/> Field3	3	-	COM_ENTITY_GROUP_MAP	v_attribute_name
<input type="checkbox"/> Field4	4	-	COM_ENTITY_GROUP_MAP	v_source_attribute_name

4. Enter the Source Date in dd/mm/yy format. You can select **Apply to all Dates** checkbox if the Excel contains date field.
5. Select **First Row is the Header** checkbox, If the first row in the Excel has headings.
6. Select the mapping database table by clicking on the + symbol or table name.
7. Click **Automap**. The respective columns with the similar names in the excel and database is mapped. You need to manually map the other columns. The mapping details are displayed in the *Mapping Information* grid which facilitates you to edit the details as required.
8. Select **Save with Authorization** checkbox to authorize and upload the data. The 3 mandatory fields i.e. Maker\_id, System\_Date, and Authorization\_Status, are displayed in the *Select Excel Columns* grid.
9. You can also select **Bulk Authorization** checkbox to assign the “Excel\_Name” across the selected column. For example, the selected column “v\_fic\_description” will have the Excel Name assigned.



---

**NOTE:** Ensure that the selected “**Varchar2**” column contains the required length to hold the Excel Name. In order to select Bulk Authorization, you need to have **Save with Authorization** checkbox selected.

---

10. Select **Save Mapping**. The *Excel-Entity Mapping* screen displays the excel-database table mapping details. In the *Excel-Entity Mappings* screen, you can also do the following:


- Click  button in the Mappings Summary tool bar to **View** the mapping details.

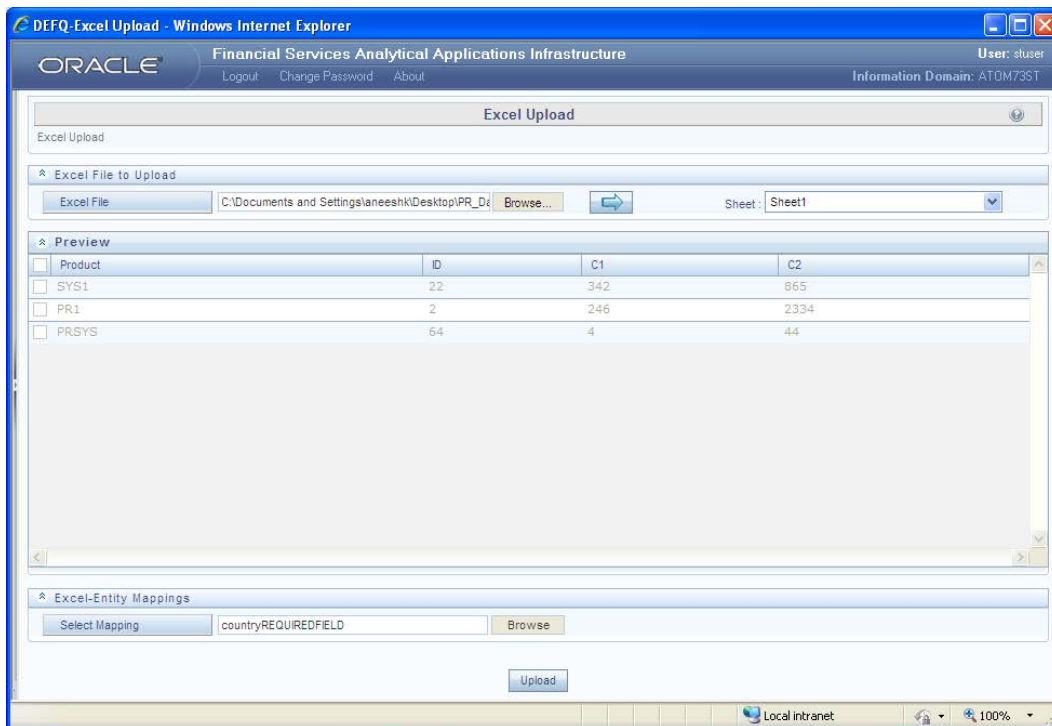
- Click  button in the Mappings Summary tool bar to **Edit** the mapping details.
- Click  button in the Mappings Summary tool bar to **Delete** the mapping details.

### ***Excel Upload***

Excel Upload helps you to upload Excel Data to destination table in the database. You need to have “XLUSER” function role mapped to access *Excel Upload* screen and retrieve mapping definition (pre-defined by XLADMIN user) to upload excel data. Excel Upload supports excel files created in Microsoft 2007 and earlier versions along with the option to map and upload multiple sheets created within a single excel file. You need to ensure that the excel data contains the dates in the format as defined in Add Excel-Entity Mapping definition.

To upload excel data in the *Excel Upload* screen:

1. Click **Browse** in the *Excel File to Upload* grid. The *Choose File to Upload* dialog is displayed.
2. Select the required Excel and click  icon. The columns in excel are populated in the **Sheet** drop down list and the *Preview* grid displays the data of the selected excel file.



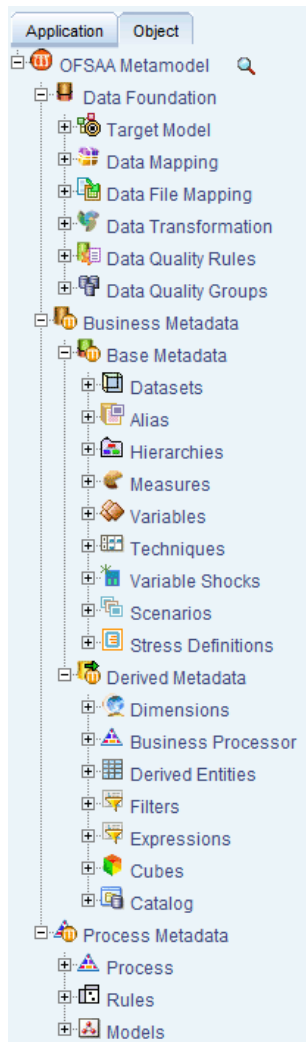
3. Click **Browse** in the *Excel-Entity Mappings* grid. The *Mapping Selector* dialog is displayed with the pre-defined mapping details.
4. Select the checkbox adjacent to the required mapping definition and click **OK**.
5. Click **Upload**. A confirmation dialog is displayed on successful upload and the excel data is uploaded to the database table.

### **2.3.3 Metadata Browser**

Metadata Browser (Object and Application View) provides common repository of metadata objects created in OFSAAI and applications hosted in OFSAAI. Using this view, you can identify the usage of base objects in higher level objects and the mapping of Objects to Application. It enables traceability and impact analysis. It also allows you to view the data flow and the work flow of the application and understand the usage of objects within the application.

The new visualization of Metadata Browser (MDB) supports Application view and Object view. In Application view, you can browse through the metadata created using the applications hosted in OFSAAI. In object view, you can view the metadata created in OFSAAI.

## Object View



The Object view will provide the following details:

- Object basic details
- Object specific details
- Mapping across objects for certain objects like T2T and Rules

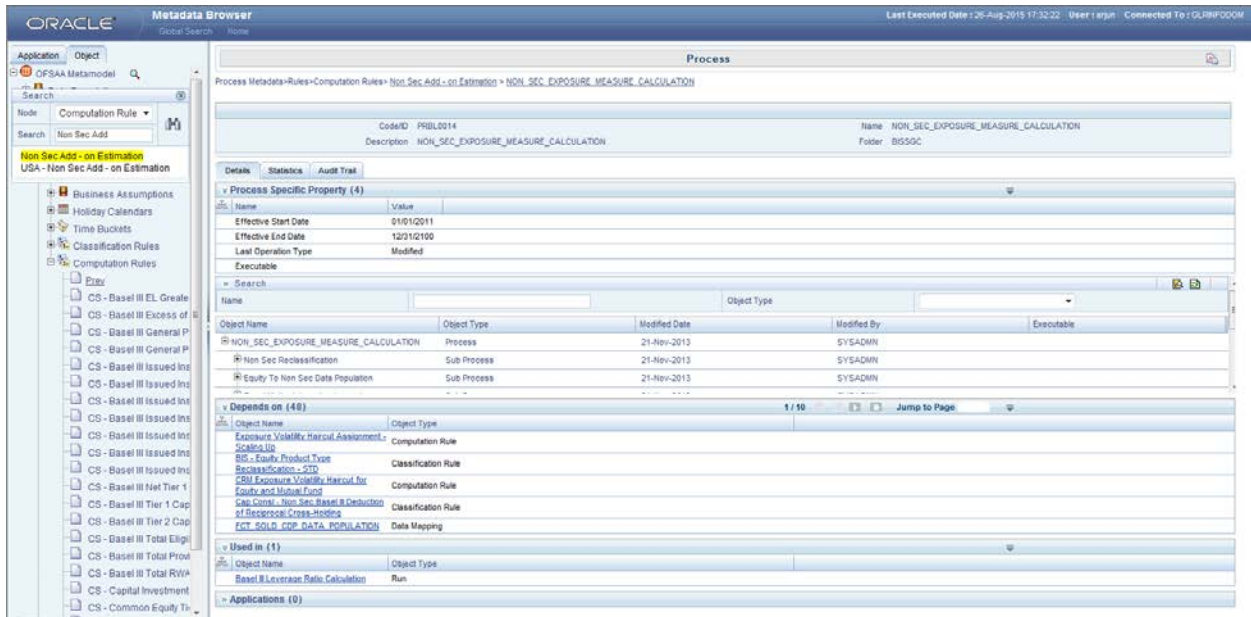
- Dependency details of the Child objects
- Usage of the current Object in the higher order objects
- Object usage in the various Applications

To help you navigate through the Metadata Browser, refer to the following steps:

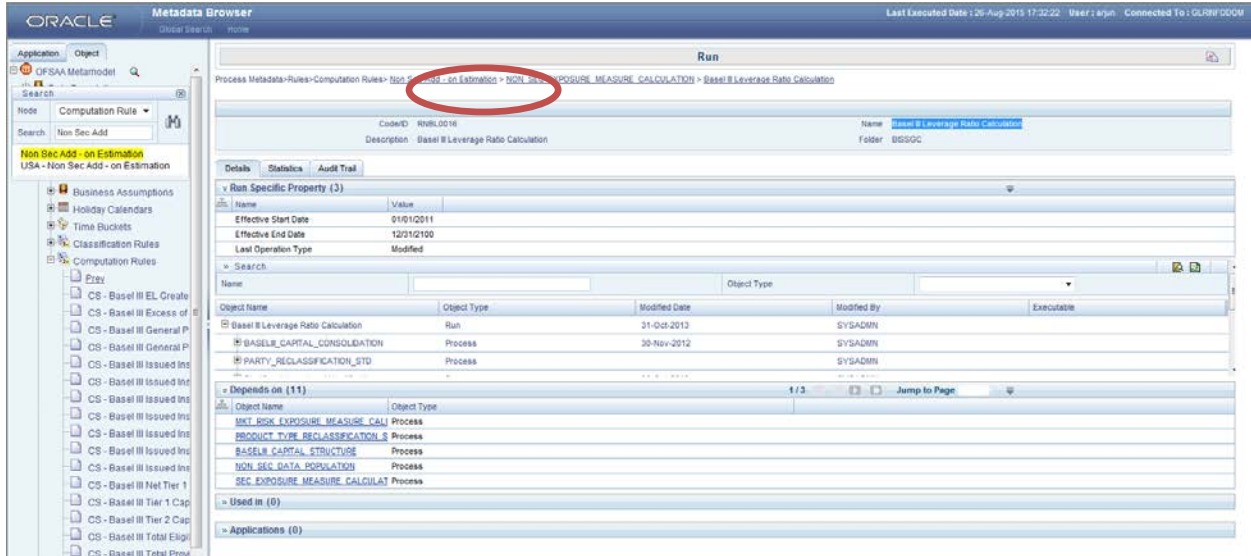
1. Select the Basel Application from the **Select Applications** drop down list in OFSAAI.
2. Click **Metadata Browser** on the LHS pane of OFSAAI. The Metadata Browser screen is displayed.
3. Select either *Application* or *Object* tab to view the underlying metadata.
4. Click **+**, to view the metadata under each category.

The screenshot displays the Oracle Metadata Browser interface. The main window shows a 'Computation Rule' for 'Non Sec Add - on Estimation'. The interface includes a left-hand navigation pane with a tree view of metadata categories, a search bar, and a main content area with tabs for 'Details', 'Statistics', and 'Audit Trail'. The 'Details' tab is active, showing properties such as 'CodeID', 'Name', 'Folder', and 'Last Operation Type'. Below the details, there are sections for 'Mapping (1)', 'Depends on (5)', 'Used in (9)', and 'Applications (1)'. The 'Used in (9)' section is expanded, showing a list of objects and their types.

Object Name	Object Type
MSR - Non Sec Add On Percent	Measure
MS - Base Add-on Category	Business Processor
Non Securitization Exposure	DataSet
Basical Hierarchy for Add-on	Hierarchy
Exposure Underlyngs Type	Hierarchy



5. Select the dependent metadata and then the underlying dependent run.



## Run

Select a Run to view the details of the Run, shown in the following figure:

Code	Name	Type	Folder	Version	Active
1305855181022	Capital Calculation - BIS Base I Approach	Base Run	BIS	0	Yes
1305855301374	Capital Calculation - BIS Standardised Approach	Base Run	BIS	0	Yes
130585512993	Capital Calculation - BIS Advanced IRB Approach	Base Run	BIS	0	Yes
1305855600303	Risk Weighted Asset Calculation - Operational Risk - BIS Standardised Approach	Base Run	BIS	0	Yes
1305855689766	Capital Calculation - BIS Foundation IRB Approach	Base Run	BIS	0	Yes
1305855864629	Risk Weighted Asset Calculation - Credit Risk - BIS Standardised Approach	Base Run	BIS	0	Yes
1305907201323	Risk Weighted Asset Calculation - Credit Risk - BIS Advanced IRB Approach	Base Run	BIS	0	Yes
1305907253832	Risk Weighted Asset Calculation - Credit Risk - BIS Foundation IRB Approach	Base Run	BIS	0	Yes
1305912873509	Capital Calculation - IFSB Standardised Approach - CAR Standard Formula	Base Run	IFSB	0	Yes
1305913610550	Risk Weighted Asset Calculation - Credit Risk - IFSB Standardised Approach	Base Run	IFSB	0	Yes
1305916596330	Capital Calculation - IFSB Standardised Approach - CAR Discretionary Formula	Base Run	IFSB	0	Yes
1305917022346	Risk Weighted Asset Calculation - Market Risk - IFSB Standardised Approach	Base Run	IFSB	0	Yes
1305917115300	Risk Weighted Asset Calculation - Operational Risk - IFSB Basic Indicator Approach	Base Run	IFSB	0	Yes
1305917182301	Staging Data Population - Market Risk - IFSB Standardised Approach	Base Run	IFSB	0	Yes
1305923761818	Staging Data Population - Market Risk - BIS Standardised Approach	Base Run	BIS	0	Yes
1306182237482	Capital Calculation - FRB IRB Approach	Base Run	USA	0	Yes
1306182268889	Risk Weighted Asset Calculation - Credit Risk - FRB IRB Approach	Base Run	USA	0	Yes
1306255867872	Capital Calculation - RBI Standardised Approach - Indian Banks	Base Run	INDIA	0	Yes
1306256086204	Capital Calculation - RBI Standardised Approach - Foreign Banks	Base Run	INDIA	0	Yes
1306256149536	Risk Weighted Asset Calculation - Credit Risk - RBI Standardised Approach	Base Run	INDIA	0	Yes

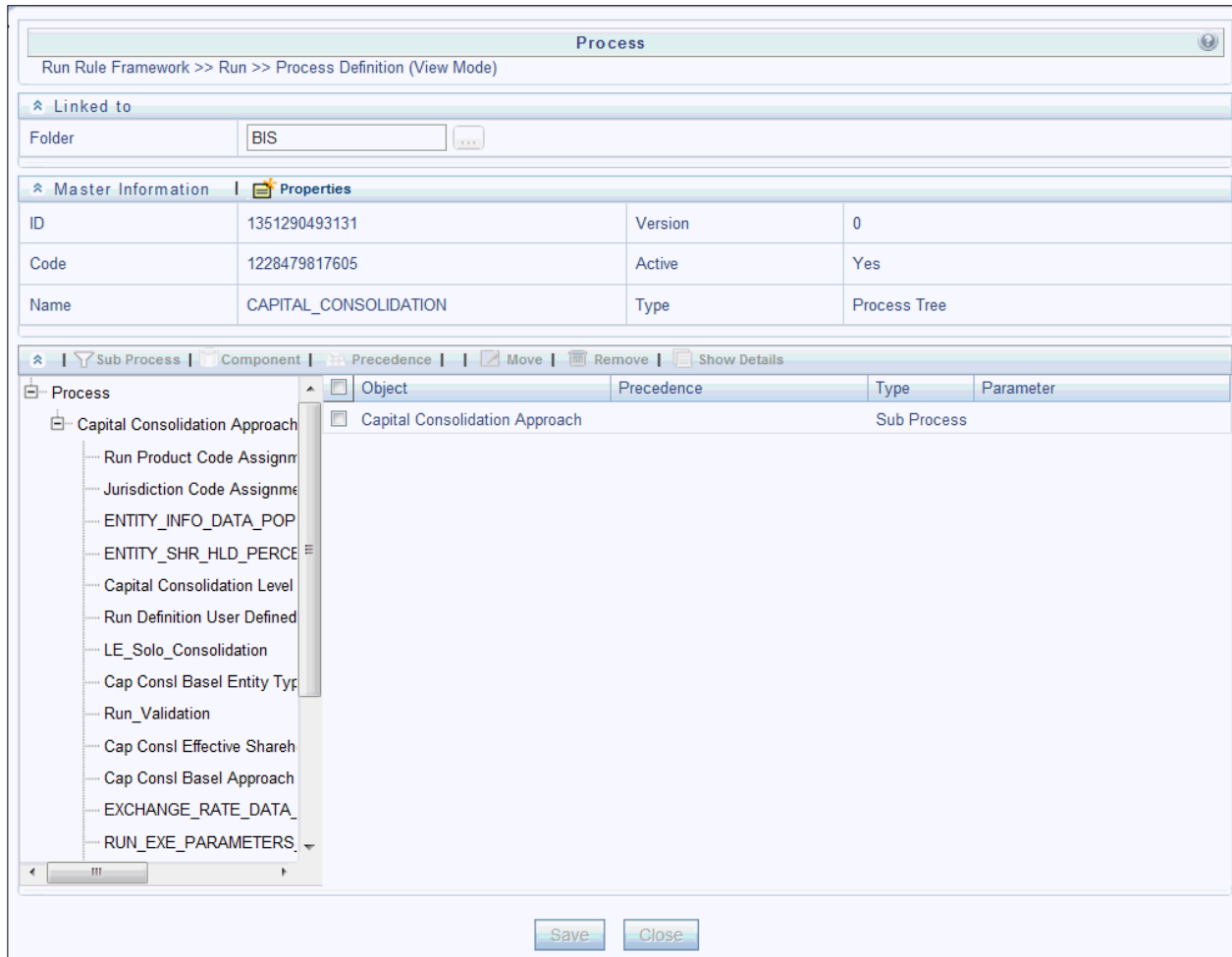
A Run is a combination of Processes. For example: For Run **Risk Weighted Asset Calculation-Credit Risk-BIS Standardized Approach**, **CAPITAL\_ CONSOLIDATION**, **CREDIT\_RATING\_PROCESSING**, and **NON SEC STD** are some of the processes mapped to the Run.

### Process and Sub Process

Location	Code	Name	Type	Simulation Job
Job	1228479817605	CAPITAL_ CONSOLIDATION	Process	
Job	1281368142488	CREDIT_RATING_PROCESSING	Process	
Job	PRBL0019	PARTY_RECLASSIFICATION_STD	Process	
Job	1308699026230	NON_SEC_DATA_POPULATION	Process	
Job	1308860226730	MITIGANT_DATA_POPULATION	Process	
Job	1308860522544	NON_SEC_EXP_MITIGANT_MAPPING_POP	Process	
Job	1259809926621	NON_SEC_STD	Process	
Job	1308846730198	SEC_DATA_POPULATION	Process	
Job	1308860632939	SEC_EXP_MITIGANT_MAPPING_POP	Process	
Job	1261519197321	SEC_STD	Process	

A process is a combination of Sub Processes. Select a Process and click to view the sub process mapped to a Process. The Sub Process mapped to the Process-**CAPITAL\_ CONSOLIDATION** is **Capital Consolidation Approach**. For Process-**CREDIT\_RATING\_PROCESSING** the Sub Process is **Credit Rating Data Population**. Rules, DT, and T2Ts, are combined to form a Sub Process. A Rule is a combination of various computational logics that transforms data. Rules are of two types:

- Computational rules (Type 3 Rule): consists of a Data Set, Source Hierarchy and Target Business Processor.
  - Data Set: A **Dataset** is a group of tables whose inter-relationship is defined by specifying a join condition between the various tables.
  - Source Hierarchy: Hierarchy is the organization of data into a logical tree structure. The subset of records on which the computational logic is applied to is stated as the Source Hierarchy.
  - Target Business Processor: Target measure is a metric which computes and stores the computed value in the defined Target Area. The target area where these computed values are populated is defined in the Target Business Processor.
- Assignment Rules (Type 2 Rule): consists of a Data Set, Source Hierarchy and Target Hierarchy.
  - Data Set: A **Data Set** is a group of tables whose inter-relationship is defined by specifying a join condition between the various tables.
  - Source Hierarchy: Hierarchy is the organization of data into a logical tree structure. The subset of records on which the computational logic is applied to is stated as the Source Hierarchy.
  - Target Hierarchy: Hierarchy is the organization of data into a logical tree structure. The target area where the reclassified records will be stored is the target hierarchy.



In the preceding figure, Rules, *DTs* and *T2Ts* mapped to a Sub Process **Capital Consolidation Approach** are as follows:

**Rules=**

Run Product Code Assignment (Type 3 Rule)  
 Run Definition Mode Assignment - User Defined (Type 3 Rule)  
 Run Definition User Defined Run Param Assignment (Type 3 Rule)  
 Capital Consolidation Level Selection (Type 3 Rule)  
 Cap Consl Basel Entity Type Reclassification (Type 2 Rule)  
 Cap Consl Effective Shareholding Percent of an Entity (Type 3 Rule)  
 Cap Consl Basel Approach Type Reclassification for Entity (Type 2 Rule)  
 Basel II Credit Rating Reclassification (Type 2 Rule)

**T2T =**


ENTITY INFO DATA POP  
 ENTITY SHR HLD PERCENT POP  
 GL ACCT CAPITAL HEAD POPULATION  
 RATING\_DETAILS\_DATA\_POPULATION  
 NON\_SEC\_EXP\_DATA\_POPULATION  
 MITIGANT\_DATA\_POPULATION  
 NON\_SEC\_EXP\_DATA\_POPULATION

**DT =**

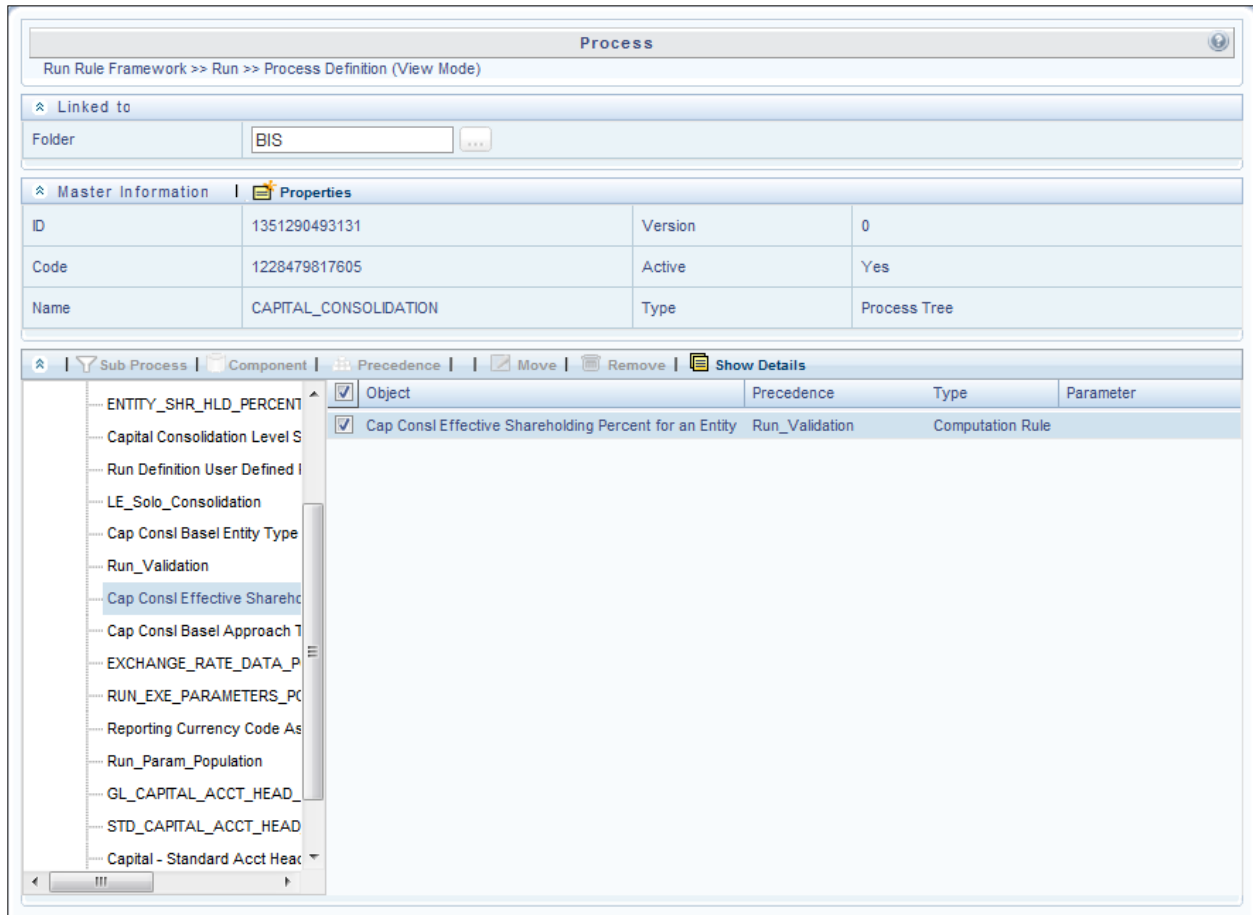
Run Validation  
 Run Param Validation  
 Upd\_Rating Details

This document will help you navigate to the smallest element of a Rule. You can similarly navigate to the smallest element of a *T2T* and *DT*.

**Rules**

Select a Rule (**Cap Consl Effective Shareholding Percent of an Entity**) from the LHS pane, the Rule which appears in the right frame of the screen. Select the Rule and click  to view the details of the Rule, as shown in the following figure:





In the following figure, for Rule **Cap Consl Effective Shareholding Percent of an Entity** (a Type 3 rule), mentioned earlier, contains a Data Set, Source Hierarchy, and Target Business Processor. To relate the Rule to a specific section in the Basel accord, refer to the Comments section in the screen.

Run Rule Framework >> Run >> Rule Definition (View Mode)

Linked to

Folder: BISSEG Dataset: Entity Shareholding Percs

Master Information | Properties

ID	1228142436138	Version	0
Code	1228142436138	Active	<input checked="" type="checkbox"/>
Name	Cap Consl Effective Shareholding Percent for an Entity	Type	Computation

List


Location	Code	Name	Type
Source	H0242	Cap Consl Entity Level Ind	Hierarchy
Target	M0719	MSR - Cap Consl Entity Shareholding Per...	Measure

Next Preview Close


Audit Trail Comments

Comments [1]




Comments	Created By	Creation Date	Last Modified By	Last Modification Date	Operation Type
Para 215-216	SYSADMN	06/25/2012 06:16:42	SYSADMN	06/25/2012 06:16:42	Not Editable

Click  in the **Dataset (DS0089)** field to view further details on the Data Set. In the following figure, the **Selected Entities** field displays the tables used by the dataset. Click any table to view the description of the table. The condition or inter-relationships between the tables are detailed in the **Join Condition** and **ANSI Join**.

Details of Dataset Entity Shareholding Percent Dataset	
<b>Name</b>	DS0089
<b>Short Description</b>	Entity Shareholding Percent Dataset
<b>Long Description</b>	Entity Shareholding Percent Dataset
<b>Comments</b>	
<b>Created By</b>	SYSADMIN
<b>Creation Date</b>	November 25, 2008 4:54:38 PM
<b>Last Modified By</b>	SYSADMIN
<b>Modification Date</b>	December 16, 2009 11:35:47 AM
<b>Authorized By</b>	SYSADMIN
<b>Authorization Date</b>	December 16, 2009 11:35:48 AM
<b>Selected Entities</b>	<a href="#">Fact Shareholding Percent</a> <a href="#">Fact Entity Information</a> <a href="#">Run Dimension</a> <a href="#">Date Dimension</a> <a href="#">PARENT_ENTITY</a>
<b>Join Condition</b>	COALESCE(PARENT_ENTITY.f_cap_cons1_parent_entity_ind,'N') = 'Y' AND COALESCE(PARENT_ENTITY.f_cap_cons1_entity_ind,'N') = 'Y'
<b>ANSI Join</b>	FCT_ENTITY_SHR_HLD_PERCENT INNER JOIN FCT_ENTITY_INFO ON FCT_ENTITY_INFO.n_entity_skey = FCT_ENTITY_SHR_HLD_PERCENT.n_investee_entity_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_run_skey = FCT_ENTITY_INFO.n_run_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_mis_date_skey = FCT_ENTITY_INFO.n_mis_date_skey INNER JOIN FCT_ENTITY_INFO PARENT_ENTITY ON FCT_ENTITY_SHR_HLD_PERCENT.n_investor_entity_skey = PARENT_ENTITY.n_entity_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_run_skey = PARENT_ENTITY.n_run_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_mis_date_skey = PARENT_ENTITY.n_mis_date_skey LEFT OUTER JOIN DIM_RUN ON FCT_ENTITY_SHR_HLD_PERCENT.n_run_skey = DIM_RUN.n_run_skey LEFT OUTER JOIN DIM_DATES ON FCT_ENTITY_SHR_HLD_PERCENT.n_mis_date_skey = DIM_DATES.n_date_skey
<b>Date Filter</b>	DIM_DATES.D_CALENDAR_DATE=\$MISDATE AND DIM_RUN.n_run_skey = '\$RUNSK'
<b>Order By</b>	

To know more about the Source Hierarchy and Target Measure used in this Type 3 Rule, return to the Rule Screen. Select the **Source Hierarchy** (Cap Cons1 Entity Level Ind) and click  icon to view details of the Source Hierarchy.


In the following figure, the Source Entity from which data is computed and populated into the Target Business Processor is displayed in the **Entity** field. Click **Fact Entity Information** to see the description of the table. Click Capital Consolidation Entity Indicator to view the description of the Attribute, whereby in this case, the entities appearing in the **Fact Entity Information** are flagged as **Y** if the entity is participating in Capital Consolidation.







Trace Dimensions Trace Cubes Trace Definitions Trace Forms

### Details of Hierarchy Cap Consl Entity Level Ind

<b>Name</b>	H0242
<b>Short Description</b>	Cap Consl Entity Level Ind
<b>Long Description</b>	Cap Consl Entity Level Ind
<b>Comments</b>	
<b>Created By</b>	SYSADMN
<b>Creation Date</b>	November 26, 2008 2:54:38 PM
<b>Last Modified By</b>	SYSADMN
<b>Modification Date</b>	November 27, 2012 7:24:08 PM
<b>Authorized By</b>	SYSADMN
<b>Authorization Date</b>	November 27, 2012 7:24:09 PM
<b>Type</b>	REGULAR
<b>BI Enabled</b>	No
<b>Is Parent Child</b>	No
<b>Entity</b>	<a href="#">Fact Entity Information</a>
<b>Attribute</b>	<a href="#">Capital Consolidation Entity Indicator</a>

**Level Details**

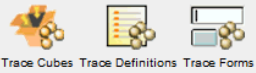
Description	Identifier	
 Cap Consl Entity Level Ind		

To know more about the Target Business Processor used in this Type 3 Rule, return to the Rule Screen. Click **Next**. In **Combination Mapper** section click  icon and select  icon to view details of the Target Business Processor.

A Business Processor (BP) consists of a Data Set, Target Measure, and an Expression.

- Data Set: A Data Set is a group of tables whose inter-relationship is defined by specifying a join condition between the various tables.
- Target Measure: Target measure is a metric which computes and stores the computed value in the defined Target Area.
- Expression: An Expression is a tool that allows for manipulation of data. Expression has three different uses:
  - To specify a calculated column that the OFSAA derives from other columns in the database
  - To calculate assignments in data correction
  - To create calculated conditions in data and relationship filters.


Click Dataset (DS0089-Entity Shareholding Percent Dataset) to view details of the Data Set. In the following figure, the **Selected Entities** field displays the tables used by the dataset. Click any table to view the description of the table. The condition or interrelationships between the tables are detailed in the **Join Condition** and **ANSI Join** field.



**Details of Dataset Entity Shareholding Percent Dataset**

<b>Name</b>	DS0089
<b>Short Description</b>	Entity Shareholding Percent Dataset
<b>Long Description</b>	Entity Shareholding Percent Dataset
<b>Comments</b>	
<b>Created By</b>	SYSADMIN
<b>Creation Date</b>	November 25, 2008 4:54:38 PM
<b>Last Modified By</b>	SYSADMIN
<b>Modification Date</b>	December 16, 2009 11:35:47 AM
<b>Authorized By</b>	SYSADMIN
<b>Authorization Date</b>	December 16, 2009 11:35:48 AM
<b>Selected Entities</b>	<a href="#">Fact Shareholding Percent</a> <a href="#">Fact Entity Information</a> <a href="#">Run Dimension</a> <a href="#">Date Dimension</a> <a href="#">PARENT_ENTITY</a>
<b>Join Condition</b>	COALESCE(PARENT_ENTITY.f_cap_cons1_parent_entity_ind,'N') = 'Y' AND COALESCE(PARENT_ENTITY.f_cap_cons1_entity_ind,'N') = 'Y'
<b>ANSI Join</b>	FCT_ENTITY_SHR_HLD_PERCENT INNER JOIN FCT_ENTITY_INFO ON FCT_ENTITY_INFO.n_entity_skey = FCT_ENTITY_SHR_HLD_PERCENT.n_investee_entity_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_run_skey = FCT_ENTITY_INFO.n_run_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_mis_date_skey = FCT_ENTITY_INFO.n_mis_date_skey INNER JOIN FCT_ENTITY_INFO PARENT_ENTITY ON FCT_ENTITY_SHR_HLD_PERCENT.n_investor_entity_skey = PARENT_ENTITY.n_entity_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_run_skey = PARENT_ENTITY.n_run_skey AND FCT_ENTITY_SHR_HLD_PERCENT.n_mis_date_skey = PARENT_ENTITY.n_mis_date_skey LEFT OUTER JOIN DIM_RUN ON FCT_ENTITY_SHR_HLD_PERCENT.n_run_skey = DIM_RUN.n_run_skey LEFT OUTER JOIN DIM_DATES ON FCT_ENTITY_SHR_HLD_PERCENT.n_mis_date_skey = DIM_DATES.n_date_skey
<b>Date Filter</b>	DIM_DATES.D_CALENDAR_DATE=\$MISDATE AND DIM_RUN.n_run_skey = '\$RUNSK'
<b>Order By</b>	

Click **Measure** (M0719-MSR - Cap Cons1 Entity Shareholding Percent) in the details of Business Processor screen, to view further details on the Target Measure. The following figure, displays the target entity where the metric or data will be populated. Click **Fact Entity Information** for details of the table. Using the Attribute, that is, **Shareholding Percentage** this measure aims to populate the shareholding percentage in the Fact Entity Table.



**Details of Measure MSR - Cap Cons1 Entity Shareholding Percent**

<b>Name</b>	M0719
<b>Short Description</b>	MSR - Cap Cons1 Entity Shareholding Percent
<b>Long Description</b>	Measure for Storing Shareholding Percent of the Entity
<b>Comments</b>	
<b>Created By</b>	SYSADMIN
<b>Creation Date</b>	November 25, 2008 12:42:54 PM
<b>Last Modified By</b>	SYSADMIN
<b>Modification Date</b>	
<b>Authorized By</b>	SYSADMIN
<b>Authorization Date</b>	November 25, 2008 12:42:54 PM
<b>Entity</b>	<a href="#">Fact Entity Information</a>
<b>Attribute</b>	<a href="#">Shareholding Percentage</a>
<b>Aggregation Type</b>	SUM
<b>Measure Type</b>	Base Measure
<b>Summary Condition</b>	1 = 1

Therefore, this Rule aims to populate the shareholding percentage of the entities in the defined target from

the master list of entities participating in the Capital Consolidation computation.

Similarly, an Assignment Rule (Type 2 Rule), as shown in the following figure, contains a Data Set, Source Hierarchy from which bank specific data is reclassified and Standardized into Basel Regulatory Capital application specific data and stored in the defined Target Hierarchy.

Rule

Run Rule Framework >> Run >> Rule Definition (View Mode)

Linked to

Folder: BISSEG Dataset: Entity Dataset

Master Information | Properties

ID	1228304537655	Version	0
Code	1228304537655	Active	<input checked="" type="checkbox"/>
Name	Cap Consl Basel Entity Type Reclassification	Type	Classification

List

Location	Code	Name	Type
Source	HBL0028	Counterparty Type	Hierarchy
Target	HBL0045	Standard Counterparty Type	Hierarchy

Next Preview Close

## Pooling

Sub Processes can also contain Pooling and Optimizer definitions. Pooling identifies and allocates Credit Risk Mitigants to each Exposure into set categories. Pooling consists of the following:

- Data Set: A **Data Set** is a group of tables whose inter-relationship is defined by specifying a join condition between the various tables.
- Pooling Basis: Pooling Basis identifies the Exposures and Mitigant data from the Fact Sub Exposures Table.
- Output: is the measure which pools the Exposures and Mitigant mapping into set categories and stores in a target area.

Click **Pooling Sub Exposures- Mitigant**, appearing under Sub Process **Exposures Mitigant Pooling** in the Run Details Screen. The following figure, displays the metadata mapped to **Pooling Sub Exposures- Mitigant**.

Details of Pooling Sub Exposures-Mitigant Pooling	
Name	Sub Exposures-Mitigant Pooling
Code	1147078004924
Created By	SYSADMN
Creation Date	08-MAY-2006 02:46:45 PM
Last Modified By	SYSADMN
Last Modification Date	12-JUN-2008 05:53:25 PM
Comments	NA
Dataset	<a href="#">Non Securitization Optimizer Dataset</a>
<b>Pooling Basis</b>	
<a href="#">Exposures</a>	
<a href="#">Mitigants</a>	
<b>Output</b>	
<a href="#">MSR - Sub Exposure Pool ID</a>	

Click Dataset (**Optimizer Dataset**) to view further details on the Dataset. In the following figure the tables used in the Data Set are displayed in the **Selected Entities** field and the inter-relationships defined between these tables are displayed as an **ANSI join** and **Join Condition**.



Details of Dataset Non Securitization Optimizer Dataset	
<b>Name</b>	DS0023
<b>Short Description</b>	Non Securitization Optimizer Dataset
<b>Long Description</b>	Non Securitization Optimizer Dataset
<b>Comments</b>	
<b>Created By</b>	SYSADMIN
<b>Creation Date</b>	October 16, 2012 1:17:36 PM
<b>Last Modified By</b>	SYSADMIN
<b>Modification Date</b>	October 27, 2012 3:53:39 PM
<b>Authorized By</b>	SYSADMIN
<b>Authorization Date</b>	October 27, 2012 3:53:40 PM
<b>Selected Entities</b>	<a href="#">Party Dimension</a> <a href="#">Fact Sub Exposures</a> <a href="#">Date Dimension</a> <a href="#">Run Dimension</a> <a href="#">Mitigant Dimension</a> <a href="#">Standard Mitigant Type Dimension</a> <a href="#">Run Identifier</a> <a href="#">Basel Product Types Dimension</a> <a href="#">Generally Accepted Accounting Principles Dimension</a> <a href="#">Country Dimension</a> <a href="#">Basel Asset Class</a> <a href="#">Run Parameters</a>
<b>Join Condition</b>	1=1
<b>ANSI Join</b>	FCT_SUB_EXPOSURES INNER JOIN DIM_DATES ON FCT_SUB_EXPOSURES.n_mis_date_skey = DIM_DATES.n_date_skey LEFT OUTER JOIN DIM_RUN ON FCT_SUB_EXPOSURES.n_run_skey = DIM_RUN.n_run_skey LEFT OUTER JOIN DIM_MITIGANT ON FCT_SUB_EXPOSURES.n_mitigant_skey = DIM_MITIGANT.n_mitigant_skey LEFT OUTER JOIN DIM_STD_MITIGANT_TYPE ON FCT_SUB_EXPOSURES.n_std_mitigant_type_skey = DIM_STD_MITIGANT_TYPE.n_std_mitigant_type_skey LEFT OUTER JOIN DIM_PARTY ON FCT_SUB_EXPOSURES.n_issuer_skey = DIM_PARTY.n_Party_Skey LEFT OUTER JOIN DIM_BASEL_PRODUCT_TYPE ON FCT_SUB_EXPOSURES.n_basel_prod_type_skey = DIM_BASEL_PRODUCT_TYPE.n_basel_prod_type_skey LEFT OUTER JOIN DIM_GAAP ON FCT_SUB_EXPOSURES.n_gaap_skey = DIM_GAAP.n_gaap_skey LEFT OUTER JOIN DIM_COUNTRY ON FCT_SUB_EXPOSURES.n_country_skey = DIM_COUNTRY.n_country_skey LEFT OUTER JOIN DIM_BASEL_ASSET_CLASS ON FCT_SUB_EXPOSURES.n_basel_asset_class_skey = DIM_BASEL_ASSET_CLASS.n_basel_asset_class_skey LEFT OUTER JOIN RUN_PARAMETERS ON FCT_SUB_EXPOSURES.n_run_parameter_setup_skey = RUN_PARAMETERS.n_run_parameter_setup_skey LEFT OUTER JOIN DIM_RUN_IDENTIFIER ON DIM_RUN_IDENTIFIER.n_run_identifier_skey = FCT_SUB_EXPOSURES.n_run_identifier_skey

Click **Exposures**, under field **Pooling Basis**, in the Details of Pooling Screen. The following figure, displays the table (**Fact Sub Exposures**) from which Exposure Data is identified using the Attribute, **Account Surrogate Key**.

Details of Hierarchy Exposures	
Name	H0131
Short Description	Exposures
Long Description	Exposures
Comments	
Created By	SYSADMN
Creation Date	October 4, 2012 1:51:45 PM
Last Modified By	SYSADMN
Modification Date	October 27, 2012 12:20:53 AM
Authorized By	SYSADMN
Authorization Date	October 27, 2012 12:20:53 AM
Type	REGULAR
BI Enabled	Yes
Is Parent Child	No
Entity	<a href="#">Fact Sub Exposures</a>
Attribute	<a href="#">Account Surrogate Key</a>
Level Details	

Click **Mitigants**, under field **Pooling Basis**, in the Details of Pooling Screen. The following figure, displays the table (**Fact Sub Exposures**) from which Mitigant Data is identified using the Attribute, **Mitigant Surrogate Key**.

Details of Hierarchy Exposures	
<b>Name</b>	H0131
<b>Short Description</b>	Exposures
<b>Long Description</b>	Exposures
<b>Comments</b>	
<b>Created By</b>	SYSADMN
<b>Creation Date</b>	October 4, 2012 1:51:45 PM
<b>Last Modified By</b>	SYSADMN
<b>Modification Date</b>	October 27, 2012 12:20:53 AM
<b>Authorized By</b>	SYSADMN
<b>Authorization Date</b>	October 27, 2012 12:20:53 AM
<b>Type</b>	REGULAR
<b>BI Enabled</b>	Yes
<b>Is Parent Child</b>	No
<b>Entity</b>	<a href="#">Fact Sub Exposures</a>
<b>Attribute</b>	<a href="#">Account Surrogate Key</a>
<b>Level Details</b>	
Description	Identifier
1	FCT_SUB_EXPOSURES.n_acct_skey='1'
2	FCT_SUB_EXPOSURES.n_acct_skey='2'
3	FCT_SUB_EXPOSURES.n_acct_skey='3'
4	FCT_SUB_EXPOSURES.n_acct_skey='4'
5	FCT_SUB_EXPOSURES.n_acct_skey='5'
6	FCT_SUB_EXPOSURES.n_acct_skey='6'
7	FCT_SUB_EXPOSURES.n_acct_skey='7'
8	FCT_SUB_EXPOSURES.n_acct_skey='8'
9	FCT_SUB_EXPOSURES.n_acct_skey='9'
10	FCT_SUB_EXPOSURES.n_acct_skey='10'
11	FCT_SUB_EXPOSURES.n_acct_skey='11'
12	FCT_SUB_EXPOSURES.n_acct_skey='12'

Click **Measure (MSR-Sub Exposures Pool ID)**, under the **Output** field, the Details of Pooling Screen. The following figure, displays the details of the measure in the output. The pooled categories of the Exposure and Mitigants data are stored in the entity **Fact Sub Exposures**. The Exposures and Mitigants data is pooled into set categories by the Attribute **Pool Identifier**.

Trace Dimensions Trace Cubes Trace Definitions T

### Details of Measure MSR - Sub Exposure Pool ID

Name	M0304
Short Description	MSR - Sub Exposure Pool ID
Long Description	Measure for Pool ID
Comments	Measure for Pool ID
Created By	BASELSOL
Creation Date	December 18, 2006 4:35:11 PM
Last Modified By	BASELSOL
Modified Date	December 18, 2006 4:35:11 PM
Authorized By	BASELSOL
Authorized Date	
Entity	<a href="#">Fact Sub Exposures</a>
Attribute	<a href="#">Pool Identifier</a>
Aggregation Type	SUM
Measure Type	Base Measure
Summary Condition	1 = 1

## Optimizer

Optimizer is a Linear Programming technique that computes the least capital based on the pooling allocation of Mitigants to Exposures. An Optimizer consists of the following Metadata:

- Data Set: A Data Set is a group of tables whose inter-relationship is defined by specifying a join condition between the various tables.
- X Variable
- Objective Function Co efficient
- Constraints
- Bounds
- Output

Click **Non Sec Optimizer-STD** under Sub Process **Exposures Mitigant Optimizer** appearing in the Run Details Screen. The following figure, displays the metadata mapped to **Non Sec Optimizer-STD**:

Details of Optimizer Non Sec Optimizer - STD			
<b>Name</b>		Non Sec Optimizer - STD	
<b>Code</b>		1147069858460	
<b>Created By</b>		SYSADMN	
<b>Creation Date</b>		08-MAY-2006 12:30:58 PM	
<b>Last Modified By</b>		SYSADMN	
<b>Last Modification Date</b>		08-JUN-2006 04:30:12 PM	
<b>Comments</b>		NA	
<b>Dataset</b>		<a href="#">Non Securitization Optimizer Dataset</a>	
<b>Operation Type</b>		Minimize	
<b>Objective Function X Variable</b>			
<a href="#">Exposures</a>			
<a href="#">Mitigants</a>			
<b>Objective Function Coefficient</b>			
<a href="#">BP - Non Sec Objective Function Co-efficient for STD</a>			
<b>Constraints</b>			
0	Exposure Constraint	Constraint Identifier	<a href="#">Exposures</a>
		Constraint Coefficient	<a href="#">BP - Sub Exposure Pre-Mitigant EAD Amt</a>
		Operator	=
		Condition Value	<a href="#">BP - Sub Exposure Pre-Mitigant EAD Amt</a>
1	Mitigant Constraint	Constraint Identifier	<a href="#">Mitigants</a>
		Constraint Coefficient	<a href="#">BP - CRM Pre-Mitigant EAD Constraint Co-Efficient</a>
		Operator	<=
		Condition Value	<a href="#">BP - Sub Exposure Mitigant Amount</a>
<b>X Variable Bounds</b>			
<a href="#">BP - Lower Bound for Optimizer</a> <= X <= <a href="#">BP - Upper Bound for Optimizer</a>			
<b>Integer Identifier</b>			
Integer Identifier			No
			NA
<b>Output</b>			
Pooling Required		Yes	
Auto Pooling		Yes	
Pooling Basis		<a href="#">MSR - CRM Covered Factor</a>	
Output		<a href="#">MSR - CRM Covered Factor</a>	

To view further details on the Dataset, like the Selected Entities used in the Data Set and the Join Condition, as shown in the following figure, click **Optimizer Data set**.

Details of Dataset Non Securitization Optimizer Dataset	
Name	DS0023
Short Description	Non Securitization Optimizer Dataset
Long Description	Non Securitization Optimizer Dataset
Comments	
Created By	SYSADMN
Creation Date	October 16, 2012 1:17:36 PM
Last Modified By	SYSADMN
Modification Date	October 27, 2012 3:53:39 PM
Authorized By	SYSADMN
Authorization Date	October 27, 2012 3:53:40 PM
Selected Entities	<a href="#">Party Dimension</a> <a href="#">Fact Sub Exposures</a> <a href="#">Date Dimension</a> <a href="#">Run Dimension</a> <a href="#">Mitigant Dimension</a> <a href="#">Standard Mitigant Type Dimension</a> <a href="#">Run Identifier</a> <a href="#">Basel Product Types Dimension</a> <a href="#">Generally Accepted Accounting Principles Dimension</a> <a href="#">Country Dimension</a> <a href="#">Basel Asset Class</a> <a href="#">Run Parameters</a>
Join Condition	1=1
ANSI Join	FCT_SUB_EXPOSURES INNER JOIN DIM_DATES ON FCT_SUB_EXPOSURES.n_mis_date_skey = DIM_DATES.n_date_skey LEFT OUTER JOIN DIM_RUN ON FCT_SUB_EXPOSURES.n_run_skey = DIM_RUN.n_run_skey LEFT OUTER JOIN DIM_MITIGANT ON FCT_SUB_EXPOSURES.n_mitigant_skey = DIM_MITIGANT.n_mitigant_skey LEFT OUTER JOIN DIM_STD_MITIGANT_TYPE ON FCT_SUB_EXPOSURES.n_std_mitigant_type_skey = DIM_STD_MITIGANT_TYPE.n_std_mitigant_type_skey LEFT OUTER JOIN DIM_PARTY ON FCT_SUB_EXPOSURES.n_issuer_skey = DIM_PARTY.n_Party_Skey LEFT OUTER JOIN DIM_BASEL_PRODUCT_TYPE ON FCT_SUB_EXPOSURES.n_basel_prod_type_skey = DIM_BASEL_PRODUCT_TYPE.n_basel_prod_type_skey LEFT OUTER JOIN DIM_GAAP ON FCT_SUB_EXPOSURES.n_gaap_skey = DIM_GAAP.n_gaap_skey LEFT OUTER JOIN DIM_COUNTRY ON FCT_SUB_EXPOSURES.n_country_skey = DIM_COUNTRY.n_country_skey LEFT OUTER JOIN DIM_BASEL_ASSET_CLASS ON FCT_SUB_EXPOSURES.n_basel_asset_class_skey = DIM_BASEL_ASSET_CLASS.n_basel_asset_class_skey LEFT OUTER JOIN RUN_PARAMETERS ON FCT_SUB_EXPOSURES.n_run_parameter_setup_skey = RUN_PARAMETERS.n_run_parameter_setup_skey LEFT OUTER JOIN DIM_RUN_IDENTIFIER ON DIM_RUN_IDENTIFIER.n_run_identifier_skey = FCT_SUB_EXPOSURES.n_run_identifier_skey
Date Filter	DIM_DATES.D_CALENDAR_DATE=\$MISDATE AND DIM_RUN.n_run_skey = '\$RUNSK' AND FCT_SUB_EXPOSURES.V_EXPOSURE_TYPE = 'NON-SEC' AND ((1- COALESCE(n_volatility_haircut,0) - COALESCE(n_forex_haircut,0) ) * COALESCE(n_maturity_mismatch_haircut,1)) > 0
Order By	

The X Variable function for Exposures identifies the Exposures data from the Entity **Fact Sub Exposures** using the Attribute **Account Surrogate Key**. The X Variable function for Mitigants identifies the Mitigants data from the Entity **Fact Sub Exposures** using the Attribute **Mitigant Surrogate Key**. Click **Exposures** or **Mitigants** to view details of the same.

Objective Function X Variable
<a href="#">Exposures</a> <a href="#">Mitigants</a>

There are two Constraints detailed in this Optimizer as follows:

- **Exposure Constraint:** ensures that the Sum of all the Sub exposures is equal to one.
- **Mitigant Constraint:** ensures that the total Mitigant amount used is less than or equal to total amount of Mitigant available. All Mitigant Haircuts are applied in this Constraint.

To view the measures used you can click the Business Processor (**BP**) shown in the following figure:

Constraints			
0	Exposure Constraint	Constraint Identifier	<a href="#">Exposures</a>
		Constraint Coefficient	<a href="#">BP - Sub Exposure Pre-Mitigant EAD Amt</a>
		Operator	=
		Condition Value	<a href="#">BP - Sub Exposure Pre-Mitigant EAD Amt</a>
1	Mitigant Constraint	Constraint Identifier	<a href="#">Mitigants</a>
		Constraint Coefficient	<a href="#">BP - Sub Exposure Pre-Mitigant EAD Constraint Co-Efficient</a>
		Operator	<=
		Condition Value	<a href="#">BP - Sub Exposure Mitigant Amount</a>

The **X Variable Bounds** defines the Lower and Upper bound of the covered factor to be between 0 and 1, shown in the following figure. Click the **BP** to view the measures mapped to the **BP**.

X Variable Bounds	
<a href="#">BP - Lower Bound for Optimizer</a>	<= X <= <a href="#">BP - Upper Bound for Optimizer</a>

The **Output** calculates and stores the percentage of exposure amount covered by a Mitigant. Click the Measure (**MSR**) to see the Entity wherein data is stored and the description of the Attribute.

Output	
Pooling Required	Yes
Auto Pooling	Yes
Pooling Basis	<a href="#">MSR - CRM Covered Factor</a>
Output	<a href="#">MSR - CRM Covered Factor</a>

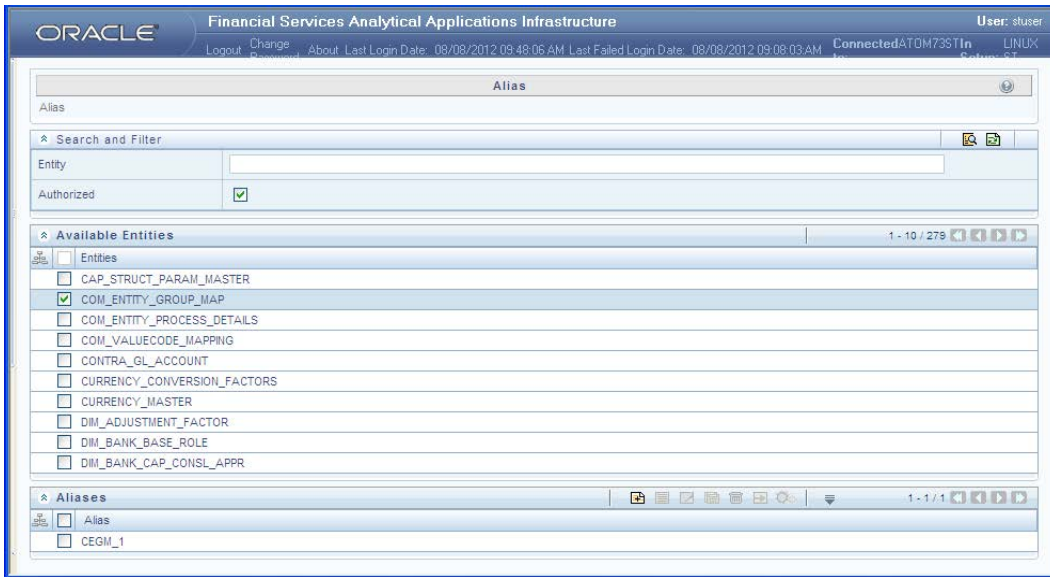
### 2.3.4 Business Metadata Management

Business Metadata consists of business names, descriptions for columns, tables and groupings, query and report definition, join-specification tool settings, and security definitions. Business Metadata Management (BMM) within the Infrastructure system facilitates business analysts with the catalog of data present in the data warehouse along with their business definitions. Business Metadata Management consists of the following components which is essential for Basel computation:

- Aliases
- Data Sets
- Business Measures
- Business Hierarchies
- Business Processor
- Derived Entities

#### Aliases


Alias refers to an assumed name or pseudonym. **Aliases** section within the Infrastructure system facilitates you to define an Alias for a table and specify the join condition between fact and dimension table. Aliases defined to a table help you to query data for varied analytical requirements.

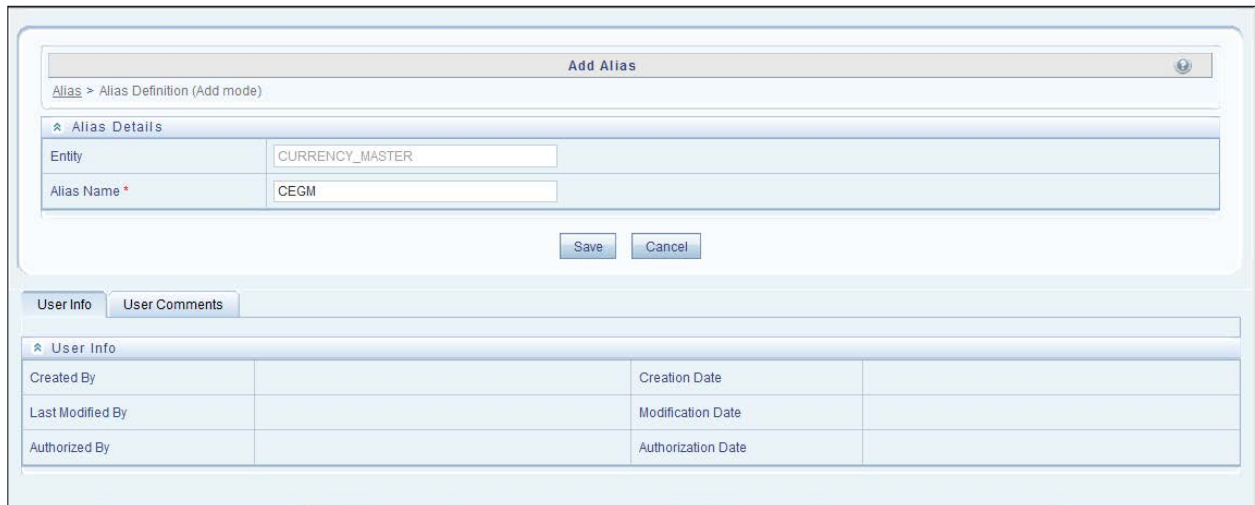


You (Business Analysts) need to have SYSBAU, Oracle Cube Administrator (ORACUB), and View Alias function roles mapped to access Aliases section in the BMM framework. You can access Aliases by expanding BMM section within the tree structure of LHS menu. The *Alias* screen displays the options to create, view, edit, copy, and delete Aliases for a selected entity. You can make use of Search and Filter option to search for specific Aliases based on entity name or authorized status.

### Add Alias

To create an Alias from the *Alias* screen:

1. Select an entity from the *Available Entities* list for which you need to create an Alias. The *Aliases* grid displays the available aliases for the selected entity.
2. Click  icon in the *Aliases* grid. The *Add Alias* screen is displayed.





The *Alias Details* grid in the *Add Alias* screen displays the entity name you have selected in a non-editable field.



3. Enter the Alias name you wish to provide for the selected entity in the **Alias Name** field.
4. Click **Save**. The Alias name is listed under the *Aliases* grid for the selected entity.

The *User Info* section at the bottom of *Add Alias* screen displays metadata information about the Alias Name created. The *User Comments* section facilitates you to add or update additional information as comments.

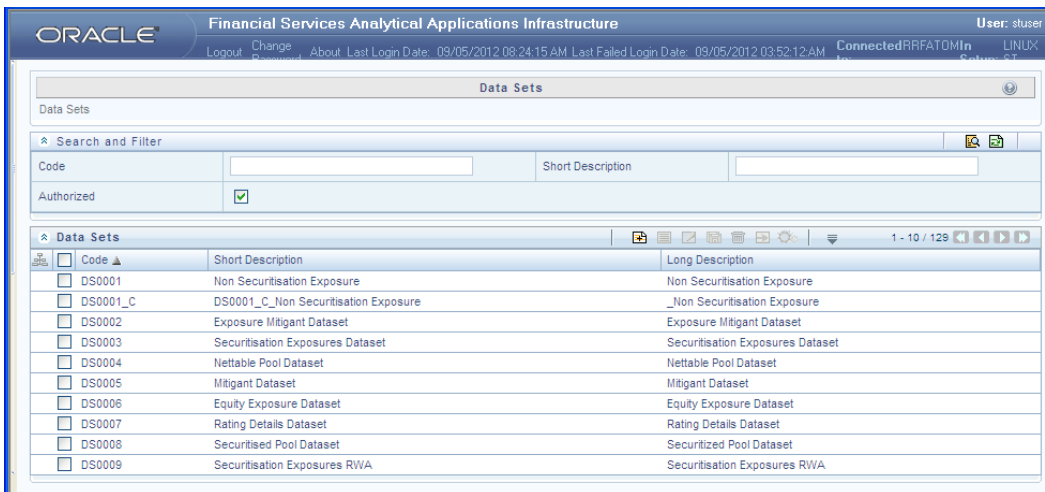
You can view individual Alias definition details at any given point. To view the existing Alias definition in the *Alias* screen, select the required Alias and click the  icon. The *View Alias* screen displays the details of the selected Alias definition. The *User Info* grid at the bottom of the screen displays the metadata information about the Alias definition along with the option to add comments.

You can remove Aliases which are assigned for an entity by clicking  icon.

## Data Sets

Data Set refers to a group of tables whose inter-relationship is defined by specifying a join condition between the various tables. It is a basic building block to create a query and execute on a data warehouse for a large number of functions and to generate reports.

Data Set function within the Infrastructure system facilitates you to create data sets for a cube and specify rules that fine-tune the information for querying, reporting, and analysis. Data Sets enhances query time by pre-defining the names of tables required for an operation (such as aggregation), and also provides the ability to optimize the execution of multiple queries on the same table set. Refer to Scenario to understand the Data Set functionality. You (Business Analysts) need to have DATVIW function role mapped to access Data Set section in the BMM framework. You can access Data Sets by expanding BMM section within the tree structure of LHS menu.




Code	Short Description	Long Description
DS0001	Non Securitisation Exposure	Non Securitisation Exposure
DS0001_C	DS0001_C_Non Securitisation Exposure	_Non Securitisation Exposure
DS0002	Exposure Mitigant Dataset	Exposure Mitigant Dataset
DS0003	Securitisation Exposures Dataset	Securitisation Exposures Dataset
DS0004	Nettable Pool Dataset	Nettable Pool Dataset
DS0005	Mitigant Dataset	Mitigant Dataset
DS0006	Equity Exposure Dataset	Equity Exposure Dataset
DS0007	Rating Details Dataset	Rating Details Dataset
DS0008	Securitized Pool Dataset	Securitized Pool Dataset
DS0009	Securitisation Exposures RWA	Securitisation Exposures RWA

The *Data Sets* screen displays the list of pre-defined Data Sets with their code and description. You can add, view, edit, copy, and delete the required Data Set. You can also make use of Search and Pagination options to search for a specific dataset based on the code, description, and Authorization status or view the list of existing datasets within the system.

### Create Data Set

You can create Data Set by defining the Data Set Details, Entities, and Data Set Definition. You need to have **DATADD** function role mapped to create Data Sets. To create Data Set in the Data Sets screen:

1. Click  icon from the Data Sets tool bar. The Add icon is disabled if you have selected a Data Set checkbox in the grid. The *Add Data Sets* screen is displayed.

The screenshot shows the 'Add Data Sets' window in Oracle. The 'Data Set Details' section contains the following information:

Code *	DS0001
Short Description *	Non Securitisation Exposure
Long Description	Non Securitisation Exposure Data set

The 'Data Set Definition' section contains the following information:



ANSI Join	WF_STAGE_DETAILS.N_STAGE_MANDATORY_IND=INSTR(STRING.STRING,#IT,INT)
Join/Filter Condition	1=1
Date Filter	RISK_MAP.HRCSA033=SYSDATE(VOD)
Order By	WF_STAGE_DETAILS.V_STAGE_DESC

At the bottom, there are 'Save' and 'Cancel' buttons, and a 'User Info' section with fields for Created By, Last Modified By, Authorized By, Creation Date, Modification Date, and Authorization Date.

2. Enter the details in the Data Set Details section as tabulated.


Field	Description
	Fields marked in red asterisk (*) are mandatory.
Code	<p>Enter a distinct code to identify the Data Set. Ensure that the code is alphanumeric with a maximum of 8 characters in length and there are no special characters except underscore “_”.</p> <p><b>Note the following:</b></p> <ul style="list-style-type: none"> <li>▪ The code can be indicative of the type of Data Set being created.</li> <li>▪ A pre-defined Code and Short Description cannot be changed.</li> <li>▪ Same Code or Short Description cannot be used for Essbase installation: "\$\$\$UNIVERSE\$\$\$", "#MISSING", "#MF", "CALC", "DIM", "ALL", "FIX", "ENDFIX", "HISTORY", "YEAR", "SEASON", "PERIOD", "QUARTER", "MONTH", "WEEK", "DAY".</li> <li>▪ In Unauthorized state, the users having Authorize Rights can view all the unauthorized Metadata.</li> </ul>


Field	Description
Short Description	Enter a Short Description based on the defined code. Ensure that the description is of a maximum of 8 characters in length and does not contain any special characters except underscore “_”.
Long Description	Enter the Long Description if you are creating subject-oriented Data Set to help users for whom the Data Set is being created or other details about the type/subject. Ensure that the description is of a maximum of 100 characters in length.


3. Select the Entities by doing the following:
  - Click Select icon from the Entities tool bar.
  - The *Entity and Attribute* screen is displayed.
  - Select the checkbox adjacent to the required fact table(s)/entities from the **Available Entities** list and click  button. You can select multiple dimension tables and link each other and with a join condition. You can also Search for the required entity using the Search field. The selected Entities are displayed in the Selected Entities grid. To delete a selected entity, select the Entity checkbox and click  icon.
  - Click **Save**. The details are populated in the *Add Data set* screen.
4. Specify the required table-join condition in the Data Set Definition grid as tabulated.


Field	Description
<b>ANSI Join</b>	The ANSI Join condition defines which set of data have been joined along with the type of join condition. It also describes the exact operations to be performed while joining the Data Sets. In ANSI join, the join logic is clearly separated from the filtering criteria.
<b>Join/Filter Condition</b>	The Join/Filter Condition facilitates the objective of creating Data Sets. Data Sets with linked tables using the join conditions help in reducing the query time. There are two ways of defining the join condition: <ul style="list-style-type: none"> <li>▪ JOIN condition for SQL Server/SQL OLAP combination should contain only EQUI JOIN condition as required by SQL OLAP.</li> <li>▪ In case of SQL Server/Essbase and Oracle/Essbase, data set must be defined. Multiple cubes can be built with a single pass and the underlying data set definition should be the same for all the cubes mapped which reduces the aggregation time considerably.</li> </ul>
<b>Date Filter</b>	The Date Filter condition enables you to cascade the cubes that are using the data set with the defined Date Filter.
<b>Order By</b>	The Order By condition enables you to sort the dimension data in order. The order of the Dimension nodes will be maintained only for Business Intelligence enabled hierarchies. The Order By condition is specific to the Essbase database.

5. Enter the required expression or click  icon to define an expression using the Expression screen.
6. Click **Save** and save the Data Set Definition details.

You can view individual Data Set details at any given point by clicking the  icon. The *View Data Sets* screen displays the details of the selected Data Set definition. The *User Info* grid at the bottom of the screen displays the metadata information about the Data Set definition created along with the option to add comments.

You can update the existing Data Set definition details except for the Code and Short Description by clicking the  icon. You need to have **DATMOD** function role mapped to modify the Data Sets.

You can copy the existing Data Set details to quickly create a new Data Set by clicking the  icon. You can later modify the Data Set Code or Short Description, add/remove tables, and also define the join conditions. You need to have **DATADD** function role mapped to copy the Data Set definitions.

You can remove the Data Set definition(s) which are created by you and which are no longer required in the system by deleting from the *Data Sets* screen by clicking the  icon. You need to have **DATDEL** function role mapped to delete a Data Set. Delete function permanently removes the Data set details from the database. Ensure that you have verified the details as indicated below:

- A Data Set definition marked for deletion is not accessible for other users.
- Every delete action has to be **Authorized/Rejected** by the authorizer.

On Authorization, the Data Set details are removed.

On Rejection, the Data Set details are reverted back to authorized state.

- You cannot update Data Set details before authorizing/rejecting the deletion.
- An un-authorized Data Set definition can be deleted.

## Business Measures

Business Measure refers to a uniquely named data element of relevance which can be used to define views within the data warehouse. It typically implies aggregated information as opposed to information at a detailed granular level that is available before adequate transformations.


Business Measure function within the Infrastructure system facilitates you to create measures based on the area of analysis. While creating a measure, you can choose the aggregation type and apply business exclusion rules based on your query/area of analysis. Business Measures can be stored as Base and Computed measures and can also be reused in defining other multi dimensional stores and query data using the various modules of Oracle Analytical Application Infrastructure. You (Business Analysts) need to have **MSRVIW** mapped to view Business Measure section in the BMM framework and **MSRADD**, **MSRMOD**, and **MSRDEL** to add, update and delete Business Measures.

Code	Short Description	Long Description	Aggregation Function	Entity	Attribute
M0001	MSR - Non Sec Outstanding Principal	Measure for Outstanding Principal	SUM	FCT_NON_SEC_EXPOSURES	n_outstanding_principal
M0001CRP	Original Exposure Pre Conversion Factors	Original Exposure Pre Conversion Factors	SUM	VW_CRP_SA_CR_NON_SEC_REP	ORIG_EXP_PRE_CONV_FACTORS
M0002CRP	Of Which Arising from Counterparty Credit Risk	Of Which Arising from Counterparty Credit Risk	SUM	VW_CRP_SA_CR_NON_SEC_REP	OF_ARISING_COUNTERPARTY_CR
M0003CRP	Value Adjustments and Provisions Associated with the Original Exposure	Value Adjustments and Provisions Associated with the Original Exposure	SUM	VW_CRP_SA_CR_NON_SEC_REP	VALUE_OF_ADJ_PROV_ORIG_EXP
M0004CRP	Guarantees	Guarantees	SUM	VW_CRP_SA_CR_NON_SEC_REP	GUARANTEES
M0005	MSR - Non Sec Add On Percent	Measure for Add On Percent	SUM	FCT_NON_SEC_EXPOSURES	n_addon_percent
M0005CRP	Credit Derivatives	Credit Derivatives	SUM	VW_CRP_SA_CR_NON_SEC_REP	CREDIT_DERIVATIVES
M0006	MSR - Non Sec Notional Principal	Measure for Notional Principal	SUM	FCT_NON_SEC_EXPOSURES	n_notional_principal
M0006CRP	Financial collateral simple method	Financial collateral simple method	SUM	VW_CRP_SA_CR_NON_SEC_REP	FIN_COLL_SIMPLE_METHOD
M0007	MSR - Non Sec Current Exposure Amount	Measure for Current Exposure Amount	SUM	FCT_NON_SEC_EXPOSURES	n_exposure_amount

The *Business Measures* screen displays the list of pre-defined Business Measures with their Code, Short Description, Long Description, Aggregation Function, Entity, and Attribute. You can add, view, edit, copy, and delete the required Business Measures. You can also make use of Search and Pagination options to search for a specific Business Measure based on the Code, Short Description, and Authorization status or view the list of existing Business Measures within the system.

### Create Business Measure

You can create a Business Measure by specifying the Business Measure Details and defining the Business Measure Definition. To create a measure in the *Business Measures* screen:

1. Click  icon from the Business Measures tool bar. The *Add Business Measures* screen is displayed.


2. Enter the details in the Business Measure Details section as tabulated.

Field	Description
Fields marked in red asterisk (*) are mandatory.	
Code	<p>Enter a distinct code to identify the Measure. Ensure that the code is alphanumeric with a maximum of 8 characters in length and there are no special characters except underscore “_”.</p> <p><b>Note the following:</b></p> <ul style="list-style-type: none"> <li>▪ The code can be indicative of the type of Measure being created.</li> <li>▪ A pre-defined Code and Short Description cannot be changed.</li> <li>▪ Same Code or Short Description cannot be used for Essbase installation: "\$\$\$UNIVERSE\$\$\$", "#MISSING", "#MI", "CALC", "DIM", "ALL", "FIX", "ENDFIX", "HISTORY", "YEAR", "SEASON", "PERIOD", "QUARTER", "MONTH", "WEEK", "DAY".</li> <li>▪ In Unauthorized state, the users having Authorize Rights can view all the unauthorized Metadata.</li> </ul>

Field	Description
Short Description	Enter a Short Description based on the defined code. Ensure that the description is of a maximum of 8 characters in length and does not contain any special characters except underscore “_”.
Long Description	Enter the Long Description if you are creating subject-oriented Measure to help users for whom the Measure is being created or other details about the type/subject. Ensure that the description is of a maximum of 100 characters in length.

- Enter the details in the Business Measure Definition section.
- Select the required **Aggregation Function** from the drop down list. The list consists of various metrics based on which a Measure can be aggregated. The available aggregation functions are as tabulated.

Aggregator	Description
SUM	Adds the actual value of attribute or data element to get the measure value.
COUNT	Counts the records for the data element to get the measure value or counts the number of occurrences
MAXIMUM	This function acquires the maximum of the data element to get the measure value.
MINIMUM	This function obtains the minimum of the data element to get the measure value.
COUNT DISTINCT	This function is different from a simple count aggregation function. The peculiarity of these measures is that they are linked to the dimensions and they vary across the hierarchies of these dimensions. In a Count Distinct aggregation function a simple roll cannot determine the values at the intermediate nodes in the hierarchies up of their leaf level values.

- Based on the selected Aggregation Function the **Data Type** is auto populated.
  - Selecting **Roll Up** checkbox calculates the measure values and displays the nodes at the total level. By default, the checkbox is selected if the Aggregation Type is Maximum, Minimum, Count, or Sum. Roll Up option, when selected with Percentage Measures results in wrong values at intermediate/total levels.
- Select the Entity to load the data for the Measure. Click the  icon, The *Entity and Attribute* screen is displayed.
    - Select the checkbox adjacent to the required Entities from the **Available Entities** list. The corresponding attributes are displayed in the **Available Attributes** list. Select the checkbox adjacent to the required Attribute.

---



**NOTE:** The Entity list is dependent on the imported Data Model.


---


You can also search for an Entity using the Search option.


- Click **Save**. The selected Entity and Attributes are displayed in the Entity field of the


*Add Business Measures* screen.

6. Define the **Business Exclusions** rules for the base Measure. You can enter the expression or click the  icon to define using the *Expression* screen.
7. Define **Filter Expression** to filter the aggregation process. You can enter the expression or click  icon to define using the *Expression* screen.
8. Click **Save** and save the Business Measure details.

You can view individual Business Measure at any given point by clicking the  icon. The *View Business Measures* screen displays the details of the selected Business Measure definition. The User Info grid at the bottom of the screen displays the metadata information about the Business Measure created along with the option to add comments.

You can update the existing Business Measure definition details except for the Code and Short Description by clicking the  icon.

You can copy the existing Business Measure details to quickly create a new Business Measure by clicking the  icon. You can later modify the Code or Short Description, add/remove Entities and Attributes, and also define the join/filter conditions. You need to have Add Business Measure function role mapped to copy the Business Measure definitions.

You can remove the Business Measure definition(s) which are created by you and which are no longer required in the system by deleting from the Business Measures screen, by clicking the  icon. You need to have Delete Measures function role mapped to delete a Business Measure. Delete function permanently removes the Business Measure details from the database. Ensure that you have verified the details as indicated below:

- A Business Measure definition marked for deletion is not accessible for other users.
- Every delete action has to be **Authorized/Rejected** by the authorizer.

On Authorization, the Business Measure details are removed.

On Rejection, the Business Measure details are reverted back to authorized state.

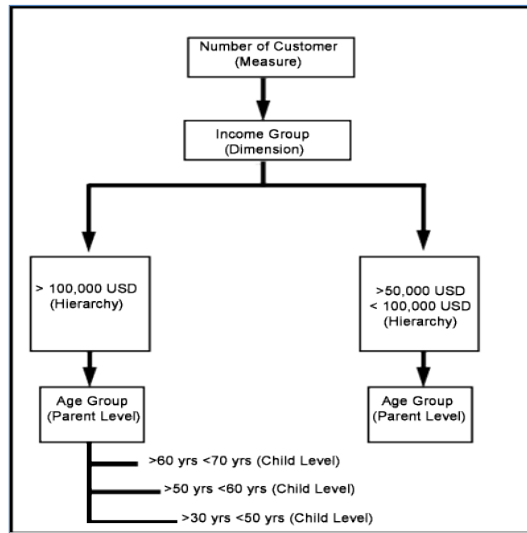
- You cannot update Business Measure details before authorizing/rejecting the deletion.
- An un-authorized Business Measure definition can be deleted.

## Business Hierarchy

Business Hierarchy refers to *Organizing Data* into logical tree structure to represent the groups and relations among various levels at which measure can be viewed. A measure can be viewed at different levels depending upon the hierarchy breakdown of the dimension category.

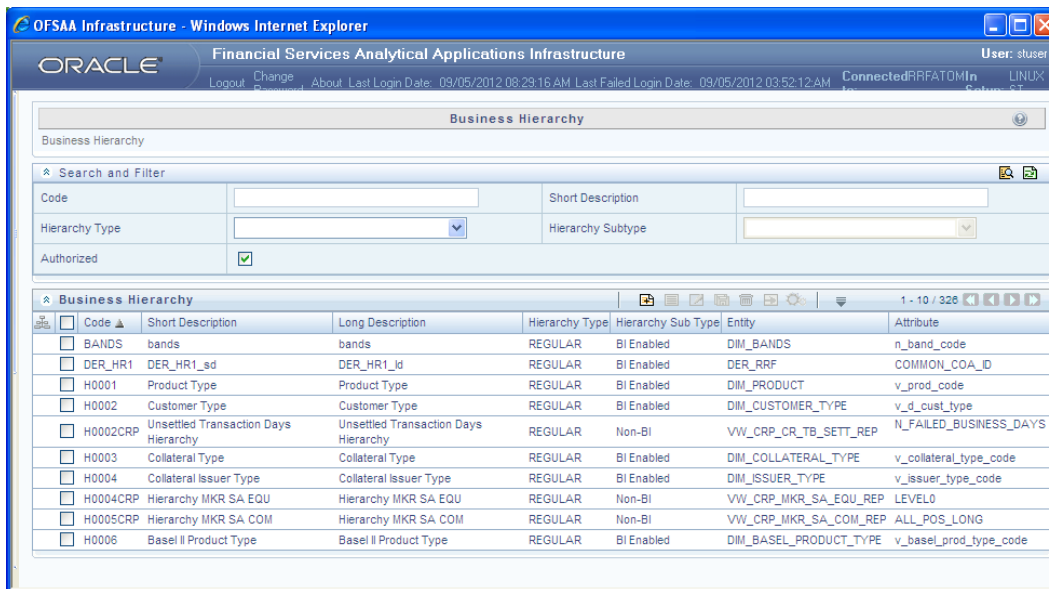
For example, consider the following structure.





You can view the Number of Customers (Measure) across Income Group (Dimension), which is further broken down by different age groups (Hierarchy). While number of customers is a metric, it is useful when viewed based on some categorization such as customer income profile or customers having an annual income of over USD 100,000 per annum, to provide better quality of information.

You (Business Analysts) need to have SYSBAU, Oracle Cube Administrator (ORACUB), and View Hierarchy function role mapped to access Business Hierarchy section in the BMM framework. You can access Business Hierarchy by expanding BMM section within the tree structure of LHS menu.




The Business Hierarchy screen displays the list of pre-defined Business Hierarchies with their Code, Short Description, Long Description, Hierarchy Type, Hierarchy Sub Type, Entity, and Attribute. You can create Business Hierarchies for measure(s), and view, edit, copy, or delete the required Business Hierarchies.

You can also make use of Search and Pagination options to search for a specific Business Hierarchy based on the Code, Short Description, Hierarchy Type, Hierarchy Sub Type, and Authorization status, or view the list of existing Business Hierarchies within the system

## Create Business Hierarchy

You can create a Business Hierarchy by specifying the Hierarchy definition details and defining the required Hierarchies. To create a Business Hierarchy in the *Business Hierarchy* screen:

1. Click  icon from the Business Hierarchy toolbar. The *Add Business Hierarchy* screen is displayed.

2. Enter the details in Business Hierarchy Details section as tabulated.

Field	Description
Code	<p>Enter a distinct code to identify the Hierarchy. Ensure that the code is alphanumeric with a maximum of 8 characters in length and there are no special characters except underscore “_”.</p> <p><b>Note the following:</b></p> <ul style="list-style-type: none"> <li>▪ The code can be indicative of the type of Hierarchy being created.</li> <li>▪ A pre-defined Code and Short Description cannot be changed.</li> <li>▪ Same Code or Short Description cannot be used for Essbase installation: "\$\$\$UNIVERSE\$\$\$", "#MISSING", "#MI", "CALC", "DIM", "ALL", "FIX", "ENDFIX", "HISTORY", "YEAR", "SEASON", "PERIOD", "QUARTER", "MONTH", "WEEK", "DAY".</li> <li>▪ In Unauthorized state, the users having Authorize Rights can view all the unauthorized Metadata.</li> </ul>

Field	Description
Short Description	Enter a Short Description based on the defined code. Ensure that the description is of a maximum of 8 characters in length and does not contain any special characters except underscore “_”.
Long Description	Enter the Long Description if you are creating subject-oriented Hierarchy to help users for whom the Hierarchy is being created or other details about the type/subject. Ensure that description is of a maximum of 100 characters in length.

- In the Business Hierarchy Definition section, select the **Hierarchy Type** from the drop down list.

---

**NOTE:** Hierarchy Type is the basic differentiator and based on your selection, the other options to define the Business Hierarchy are available.

---

You can select the following Hierarchy Type/Sub-Type. Click the links to navigate to the respective sections and define the required Hierarchy.


Hierarchy Type	Description / Hierarchy Sub Type													
Regular	<p>In a Regular Hierarchy Type, you can define the following Hierarchy Sub Types:</p> <ul style="list-style-type: none"> <li>Non Business Intelligence Enabled                     <p>In a non Business Intelligence Enabled Hierarchy, you need to manually add the required levels. The levels defined will form the Hierarchy.</p> </li> <li>Business Intelligence Enabled                     <p>You can Enable Business Intelligence hierarchy when you are not sure of the Hierarchy structure leaf values or the information is volatile and also when the Hierarchy structure can be directly selected from RDBMS columns. The system will automatically detect the values based on the actual data.</p> <p>In a BI enabled Hierarchy, you will be prompted to specify if a Total node is required (not mandatory) and system auto-detects the values based on actual data. For example, you can define three levels in BI Enabled hierarchies like, Region (1), State (2), and Place (3). The auto generated Hierarchies are:</p> <table border="1" data-bbox="634 1539 1182 1806"> <thead> <tr> <th>Region (1)</th> <th>State (2)</th> <th>Place (3)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">South</td> <td>Tamil Nadu</td> <td>Madras</td> </tr> <tr> <td>Karnataka</td> <td>Bangalore</td> </tr> <tr> <td>Andhra Pradesh</td> <td>Hyderabad</td> </tr> <tr> <td>North</td> <td>Punjab</td> <td>Chandigarh</td> </tr> </tbody> </table> </li> </ul> <ul style="list-style-type: none"> <li>Parent Child</li> </ul>	Region (1)	State (2)	Place (3)	South	Tamil Nadu	Madras	Karnataka	Bangalore	Andhra Pradesh	Hyderabad	North	Punjab	Chandigarh
Region (1)	State (2)	Place (3)												
South	Tamil Nadu	Madras												
	Karnataka	Bangalore												
	Andhra Pradesh	Hyderabad												
North	Punjab	Chandigarh												


Hierarchy Type	Description / Hierarchy Sub Type
	This option can be selected to define a Parent Child Type hierarchy.
Measure	A Measure Hierarchy consists of the defined measure as nodes and has only the <i>Non Business Intelligence Enabled</i> as Hierarchy Sub Type.
Time	A Time Hierarchy consists of the levels/nodes of high time granularity and has only the <i>Business Intelligence Enabled</i> as Hierarchy Sub Type.


**NOTE:** When the defined Hierarchy consists of more than 100 leaf levels, the system treats it as a Large Hierarchy in order to provide efficient and optimized hierarchy handling. For more information on modify the default value, refer Large Hierarchy.


Once you have populated the required details in Business Hierarchy Definition and Hierarchy details section, save the details.

4. Click **Save** in *Add Business Hierarchy* screen and save the details.

You can view individual Business Hierarchy at any given point by clicking the  icon. The *View Business Hierarchy* screen displays the details of the selected Business Hierarchy definition. The *User Info* grid at the bottom of the screen displays metadata information about Business Hierarchy created along with the option to add comments.

You can update the existing Business Hierarchy definition details except for the Code, Short Description, and Hierarchy Type/Sub-Type, by clicking the  icon. You need to have Modify Hierarchy function role mapped to modify the Business Hierarchy definitions.

You can copy the existing Business Hierarchy details to quickly create a new Business Hierarchy, by clicking the  icon. You need to have Add Hierarchy function role mapped to copy the Business Hierarchy definitions.

You can remove the Business Hierarchy definition(s) which are created by you and which are no longer required in the system by deleting from the *Business Hierarchy* screen, by clicking the  icon. You need to have Delete Hierarchy function role mapped to delete a Business Hierarchy. Delete function permanently removes the Business Hierarchy details from the database. Ensure that you have verified the details as indicated below:

- A Business Hierarchy definition marked for deletion is not accessible for other users.
- Every delete action has to be **Authorized/Rejected** by the authorizer.

On Authorization, the Business Hierarchy details are removed.

On Rejection, the Business Hierarchy details are reverted back to authorized state.

- You cannot update Business Hierarchy details before authorizing/rejecting the deletion.
- An un-authorized Business Hierarchy definition can be deleted.

## Business Processor


Business Processor refers to a uniquely named data element of relevance which can be used to define views



Field	Description
Code	While creating a new Business Processor, you need to define a distinct identifier/Code. It is recommended that you define a code that is descriptive or indicative of the type of Business Processor being created. This will help in identifying it while creating rules.  Note the following: <ul style="list-style-type: none"> <li>It is mandatory to enter a Code.</li> <li>The Code should be minimum eight characters in length; it can be alphabetical, numerical (only 0-9) or alphanumeric characters.</li> <li>The Code should start with an Alphabet.</li> <li>The Code cannot contain special characters with the exception of the underscore symbol (_).</li> <li>The saved Code or Short Description cannot be changed.</li> </ul>


2. Enter the details as tabulated:

Field	Description
Code	While creating a new Business Processor, you need to define a distinct identifier/Code. It is recommended that you define a code that is descriptive or indicative of the type of Business Processor being created. This will help in identifying it while creating rules.  Note the following: <ul style="list-style-type: none"> <li>It is mandatory to enter a Code.</li> <li>The Code should be minimum eight characters in length; it can be alphabetical, numerical (only 0-9) or alphanumeric characters.</li> <li>The Code should start with an Alphabet.</li> <li>The Code cannot contain special characters with the exception of the underscore symbol (_).</li> <li>The saved Code or Short Description cannot be changed.</li> </ul>

Field	Description
Short Description	<p>Short description is useful in understanding the content of the Business Processor you are creating. It would help to enter a description based on the code.</p> <p>Note the following:</p> <ul style="list-style-type: none"> <li>▪ It is mandatory to enter a Short Description.</li> <li>▪ The Short Description should be of minimum one character and maximum of 80 characters in length.</li> <li>▪ Only Alphanumeric, non-English, and Special characters such as “&lt;blank space&gt;”, “.”, “\$”, “&amp;”, “%”, “&lt;”, “&gt;”, “()”, “(“”, “_”, and “-” are permitted to be entered in the Short Description field.</li> </ul>
Long Description	<p>The long description gives an in-depth understanding of the Business process you are creating. It would help you to enter a Long Description based on the code.</p> <p>The Long Description should be of minimum one character and maximum 100 characters in length.</p>
Data Set	<p>Select the Data Set from the drop-down list. The list of available Data Sets for the selected Information Domain will appear in the drop-down.</p> <p>The Short Description of the Data Sets as entered in the <i>Data Sets</i> screen under <b>Business Metadata Management</b> will be reflected in the dropdown.</p>
Measure	<p>Select the Measure from the drop-down list. All base measures that are defined on any of the tables present in the selected Data Set will appear in the drop-down.</p> <p>If the underlying measure is deleted after the Business Processor definition, then the corresponding <b>Business Processor</b> definition will automatically be invalidated.</p>
Expression	<p>Click  icon. The <i>Expression</i> screen is displayed.</p> <p>The placeholder option enables the user to provide values for the constants in the expression. The user can specify values to the business processor expression during the run time rather than at definition time through the place holders defined while specifying the expression. The user can specify the expression in the “<b>Expression</b>” field.</p> <p>Note the following:</p> <ul style="list-style-type: none"> <li>▪ The values for the placeholders can be alphanumeric.</li> <li>▪ The process of specifying place holders enables the user to execute the same business processor definition with different values during the run time.</li> </ul>

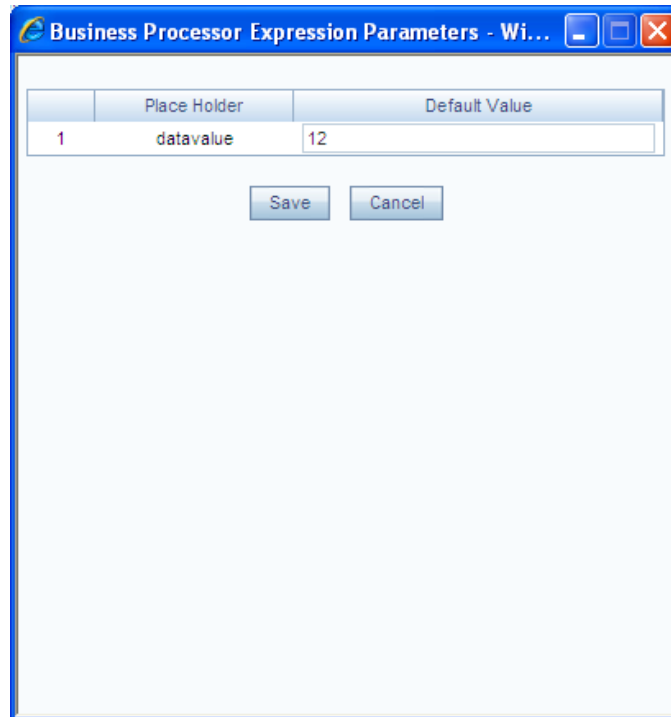
Field	Description
Expression has Aggregate Function	The expression may require an aggregation function depending on the business logic. The aggregation functions have to be entered in the expression field per acceptable syntax. IF an aggregation function is used in the expressions, the checkbox “ <b>Expression has Aggregate Function</b> ” must be enabled. Leave the checkbox “ <b>Expression has Aggregate Function</b> ” blank if your expression does not contain an aggregation function.

You can also:


Click  icon in the *Business Processor Definition* grid to refresh the entries.

Click **Parameters** button to specify default values for any of the placeholders defined.

The *Business Processor Expression Parameters* dialog is displayed.






3. Enter a default value for the place holders defined along with the expression in the **Default Value** box.
4. Click **Save** to save the default value for a Place Holder. The *User Info* grid at the bottom of the screen displays the metadata information about the Business Processor definition created along with the option to add comments.
5. Click **Save**. The Business Processor is saved and listed in the *Business Processor* screen after validating the entries.

You can view individual Business Processor definition details at any given point, by clicking the  icon. The *View Business Processor* screen displays the details of the selected Business Processor definition. The



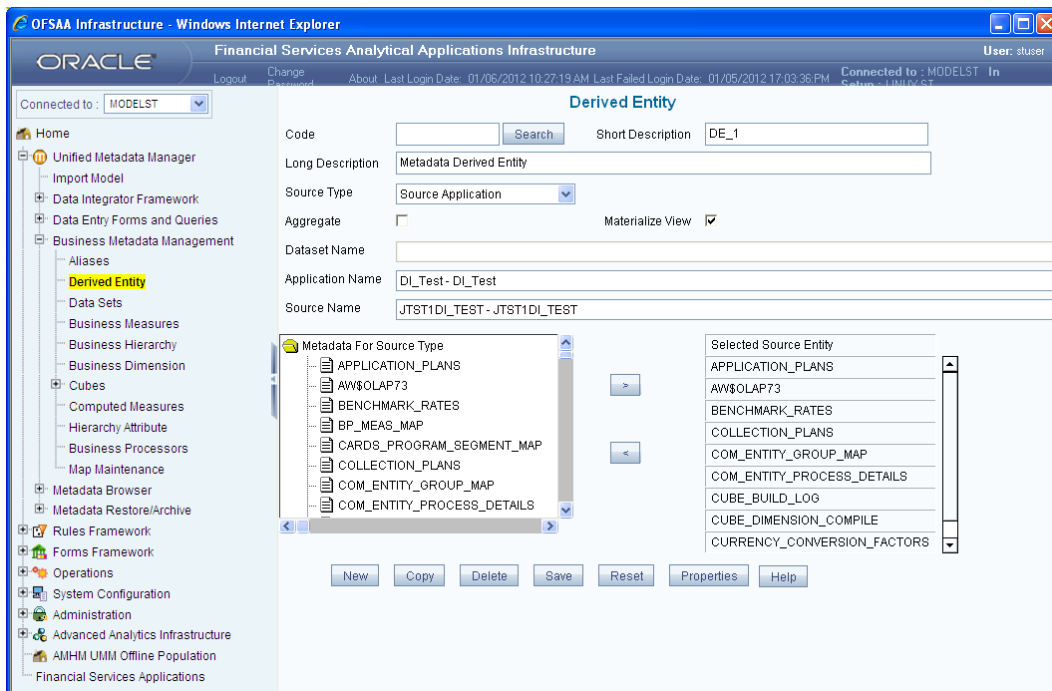
*User Info* grid at the bottom of the screen displays the metadata information about the Business Processor definition along with the option to add comments.

You can update the existing Business Processor definition details except for the Business Processor Code and Short Description, by clicking the  icon.

You can copy the existing Business Processor to quickly create a new Business Processor definition based on the existing rule details or by updating the required parameters, by clicking the  icon. You can remove Business Processor definition(s) which are no longer required in the system by clicking the  icon.

## Derived Entity

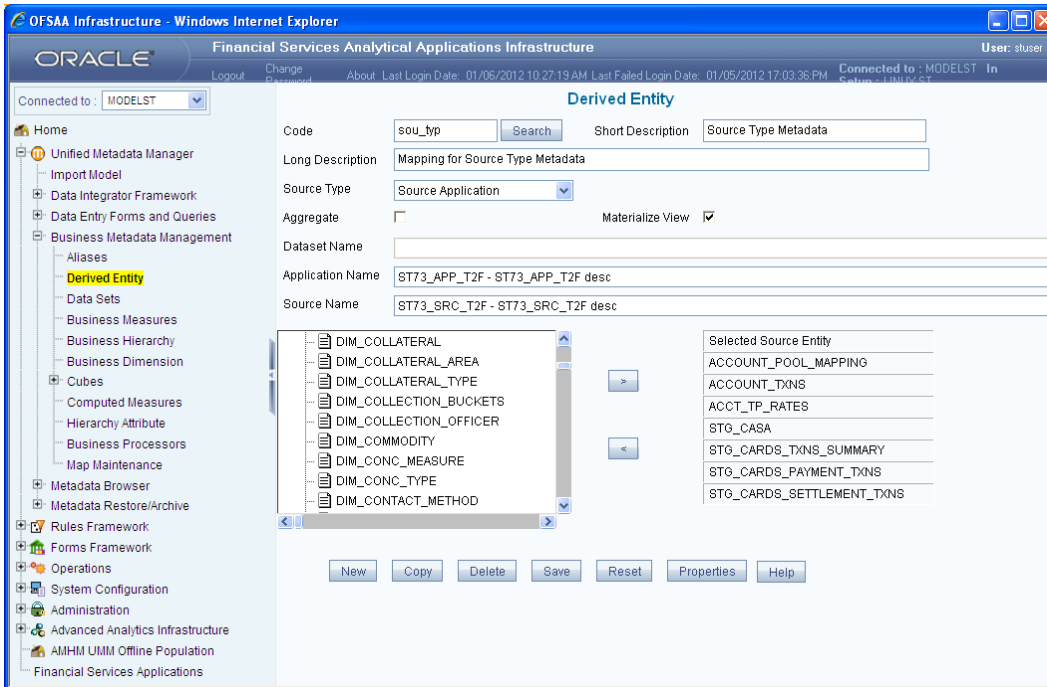
Entity refers to a table in which data is stored. Derived Entity within the Infrastructure system facilitates you to define entities which are populated through a series of data transformation processes resulting from an existing Data Set or a Source Application. An Entity can be used to define other Business Metadata such as measures, hierarchies, dimensions, data sets, and cubes.



You (Business Analysts) need to have View Derived Entities function role mapped to access Derived Entity section in the BMM framework. You can access Derived Entity by expanding BMM section within the tree structure of LHS menu. The *Derived Entity* screen displays the options to define and edit the derived entity definitions for a selected table.

### Create Derived Entity

You can define Derived Entity only if you have Add Derived Entity function role mapped in the Infrastructure system. You can create a Derived Entity based on Data Set or Source Application. To define a Derived Entity based on Source Application, you need to have defined permissions for the particular Source Application in the Atomic schema. You can also authorize a Derived Entity created by other users if you have the authorizer rights.




To create a Derived Entity in the *Derived Entity* screen:

1. Click **New** if you are defining the derived entity for the first time.
2. Enter the details as tabulated.

Field	Description
Code	<p>Enter a distinct code to identify the Entity. Ensure that the code is alphanumeric with a maximum of 8 characters in length and there are no special characters except underscore “_”.</p> <p><b>Note the following:</b></p> <ul style="list-style-type: none"> <li>▪ The code can be indicative of the type of Derived Entity being created.</li> <li>▪ A pre-defined Code and Short Description cannot be changed.</li> <li>▪ Same Code or Short Description cannot be used for Essbase installation: "\$\$\$UNIVERSE\$\$\$", "#MISSING", "#MI", "CALC", "DIM", "ALL", "FIX", "ENDFIX", "HISTORY", "YEAR", "SEASON", "PERIOD", "QUARTER", "MONTH", "WEEK", "DAY".</li> <li>▪ In Unauthorized state, the users having Authorize Rights can view all the unauthorized Metadata.</li> </ul> <p>You can also search for an existing code or Derived Entity.</p> <ul style="list-style-type: none"> <li>▪ Click <b>Search</b>, the <i>Search</i> screen is displayed.</li> </ul>

Field	Description
	<ul style="list-style-type: none"> <li>▪ Double-click the required code from the list of available Derived Entities or enter the description for the required Derived Entity in <b>Description Filter</b> and press <b>Enter</b>. The matching Derived Entity code is displayed.</li> <li>▪ Select <b>List Un Authorized</b> checkbox to view all the un authorized metadata.</li> </ul>
Short Description	Enter a Short Description based on the defined code. Ensure that the description is of a maximum of 80 characters in length and does not contain any special characters except “_ , ( ) , - , \$”.
Long Description	Enter the Long Description if you are creating subject-oriented Derived Entity to help users for whom the Derived Entity is being created or other details about the type/subject. Ensure that the description is of a maximum of 100 characters in length.
Source Type	Select either <b>Data Set</b> or <b>Source Application</b> from the drop down list.
Aggregate	Select <b>Aggregate</b> checkbox to collate the information for the Derived Entity.
Materialize View	(Optional) Select the <b>Materialize View</b> checkbox if you are using Oracle database to create a Materialized View with the Derived Entity Name and short description. <b>Note:</b> You cannot enable the Materialize View option if you are using IBM DB2 database.
Data Set Name	<i>Option available only if the Source Type is selected as <b>Data Set</b>.</i> Select the <b>Data Set Name</b> from the drop-down list. The Short Description for the Data Sets is available in the drop down list to select.
Application Name	<i>Option available only if the Source Type is selected as <b>Source Application</b>.</i> Select the <b>Application Name</b> from the drop down list.
Source Name	<i>Option available only if the Source Type is selected as <b>Source Application</b>.</i> Based on the Application selected the related Sources are listed. Select the <b>Source Name</b> from the drop-down list.

On selecting the Data Set Name or Source Application Name, the respective fields are displayed in the **Metadata for Source Type** list.

1. Double-click **Metadata for Source Type**. The list of Metadata defined on the selected Data Set or Application and Source is displayed.
2. Click + to expand the folders. Select the required metadata and click .
3. Click **Save**. A confirmation dialog is displayed. The details are displayed in the *Derived Entity* screen with the **Code** and **Short Description** as non-editable fields.

You can copy the pre-defined Derived Entity details to create another entity only if you have View Derived Entity, Add Derived Entity, and Modify Derived Entity function roles mapped.

To copy a Derived Entity in the *Derived Entity* screen, enter the description in the **Description Filter** box and press **Enter**. Click **Copy**. On completion, a confirmation dialog is displayed.

You can view the metadata of the selected Derived Entity. In the *Derived Entity* screen click **Properties** and open the *Properties* dialog.

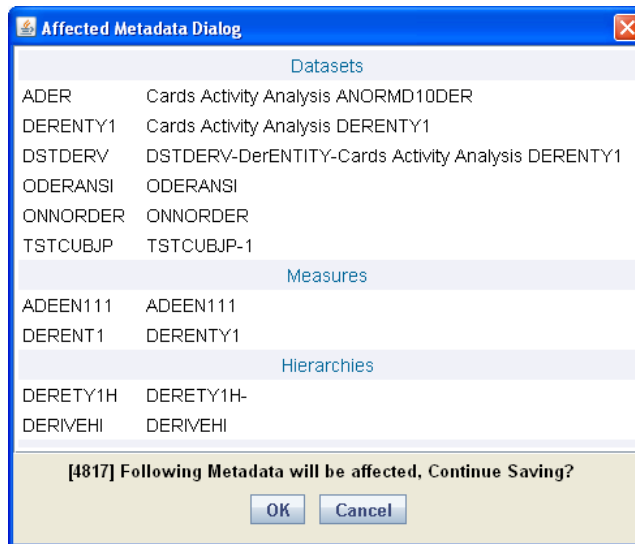
The *Properties* tab displays the metadata properties such as Created By, Creation Date, Last Modified By, Modified Date, Authorized By, and Authorized Date.

The *Comments* tab has a text field to enter additional information as comments about the created Derived Entity definition.

Click **OK** and save the definition with the comments (if any).

You can search for a Derived Entity and modify the details as required by clicking Edit. You need to have Modify Derived Entity function role mapped to edit/modify the Derived Entity definitions. A Derived Entity definition in the un-authorized state (modified by other users) cannot be modified.

When you modify a Derived Entity which is mapped to other metadata definition, the *Affected Metadata* Dialog is displayed with the list of mapped Data Sets, Measures, and Hierarchies which gets auto updated. Click **OK** to confirm, else click **Cancel**.



You can delete a Derived Entity that you have created or if you are authorized to do so. A Derived Entity in **Un-Authorized** state (modified by other users) cannot be deleted. You need to have Delete Derived Entity function role mapped to delete a Derived Entity. Delete function permanently removes the Derived Entity from the database. Ensure that you have verified the details as indicated below:

- A Derived Entity definition marked for deletion is not accessible for other users.
- Every delete action has to be **Authorized/Rejected** by the authorizer.

On Authorization, the Derived Entity details are removed.

On Rejection, the Derived Entity details are reverted back to authorized state.

- You cannot update Derived Entity details before authorizing/rejecting the deletion.
- An un-authorized Derived Entity definition can be deleted.

## 2.4 Rules Framework

Financial institutions require constant monitoring and measurement of risk in order to conform to prevalent regulatory & supervisory standards. Such measurement often entails significant computations and validations

with an organization's data. Data must be transformed to support such measurements and calculations. The data transformation is achieved through a set of defined Rules. Rules Framework facilitates you to define a set of rules, reporting objects, and processes that are required to transform data in a warehouse. You can execute Rules and Process and manage to pre-defined rules within the system.

The Rules Framework is used for following three main purposes:

- To design a set of rules, processes and structuring execution flow of processes that are required to transform data in a data warehouse or data store.
- To design reporting objects based on previously transformed data that is stored as aggregated data in multidimensional databases.
- To design reporting objects based on the atomic information stored in the data warehouse or data store.

Before you begin, do the following:

- Select the required **Information Domain**: An Information Domain refers to a logical grouping of specific information and defines the underlying data warehouse or data store in which the physical data model has been implemented. When you login to the Infrastructure system, you can access only those Information Domains to which your user ID is mapped. Contact System Administrator for permissions to access a specific Information Domain.
- Select the associated **Segment**: Segments are defined through the Administration module. A Segment facilitates you to classify all the related metadata in the selected Information Domain. You are authorized to access only those metadata objects to which the segment and user roles have been mapped.

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**NOTE:**

- For Rules framework functionality, the default system roles that are required are Business Analyst, OBIEE Author, and PR2 Administrator.
  - User mapped to the role PR2ADMIN will be able to access metadata objects across all segments within an Information Domain through the Rules, Process, and Run Framework.
  - The users mapped to the PR2 Administrator role will have the rights to Add, View, Edit, and Delete definitions defined in the Rule, Process, and Run screens.
  - Users mapped to the particular Information Domain and segment can view only the Rules/Process/Run definitions defined in the selected Information Domain and segment.
- 

Rules Framework is available within the LHS menu of the Infrastructure home page.

The screenshot displays the Oracle Financial Services Analytical Applications Infrastructure (FAAI) interface. The main window is titled 'Rule' and shows a list of rules. The left-hand navigation pane includes sections like 'Rules Framework', 'Administration', and 'Advanced Analytics Infrastructure'. The main area features a search and filter section with fields for Code, Name, Version, Active, Folder, and Type. Below this is a table with the following columns: Code, Name, Type, Folder, Dataset, Version, and Active. The table lists 20 rules, including 'Non Sec Add - on Estimation', 'Basel I Customer Type Reclassification', and 'Equity RWA Calculation'.

Code	Name	Type	Folder	Dataset	Version	Active
1111241886631	Non Sec Add - on Estimation	Computation	BIS	Non Securitisation Exposure	0	Yes
1117016036934	Basel I Customer Type Reclassification	Classification	BIS	Non Securitisation Exposure	0	Yes
1128403465564	Non Sec Expected Loss Band Skey Assignme...	Computation	BIS	Non Securitization Band Skeys	0	Yes
1128411980620	Sec Exposure Risk Weight Band Skey Assig...	Computation	BIS	RWA Computations - Securitizat...	0	Yes
1136285107137	Non Sec Pre-Mitigation Capital Required ...	Computation	BIS	Non Securitisation Exposure	0	Yes
1136287177302	Non Sec Effective Maturity Assignment - ...	Computation	BIS	Non Securitisation Exposure	0	Yes
1137126999734	Non Sec Pre-Mitigation PD Assignment	Computation	BIS	Non Securitisation Exposure	0	Yes
1137496095751	Non Sec Capital Required for UL - Default...	Computation	BIS	Non Securitisation Exposure	0	Yes
1137496648996	Non Sec Pre-Mitigation EAD Amount - IRB	Computation	BIS	Non Securitisation Exposure	0	Yes
1137497129859	Non Sec RWA For Dilution Risk	Computation	BIS	Non Securitisation Exposure	0	Yes
1137561353899	Equity Correlation Factor	Computation	BIS	Equity Exposure Dataset	0	Yes
1137561926026	Equity RWA Calculation	Computation	BIS	Equity Exposure Dataset	0	Yes
1137645483897	Non Sec Basel II Transaction Type Reclas...	Classification	BIS	Non Securitisation Exposure	0	Yes
1137646268878	Party Type Reclassification - IRB	Classification	BIS	Party type reclassification - ...	0	Yes
1137646548485	Non Sec Basel II Asset Class Reclassific...	Classification	BIS	Non Securitisation Exposure	0	Yes
1137646548485_bkp	Non Sec Basel II Asset Class Reclassific...	Classification	BIS	Non Securitisation Exposure	0	Yes
1137651218893	Equity Minimum RW Assignment - PD - LGD ...	Computation	BIS	Equity Exposure Dataset	0	Yes
1137651249717	Non Sec Pre-Mitigation Post Volatility H...	Computation	BIS	Non Securitisation Exposure	0	Yes
1137656131798	Non Sec Pre-Mitigation Risk Weight - UL	Computation	BIS	Non Securitisation Exposure	0	Yes
1137656202121	Non Sec Pre-Mitigation Risk Weight - EL	Computation	BIS	Non Securitisation Exposure	0	Yes

## 2.4.1 Rules

Financial institutions require constant monitoring and measurement of risk in order to conform to prevalent regulatory & supervisory standards. Such measurement often entails significant computations and validations with an organization's data. Data must be transformed to support such measurements and calculations. The data transformation is achieved through a set of defined Rules.

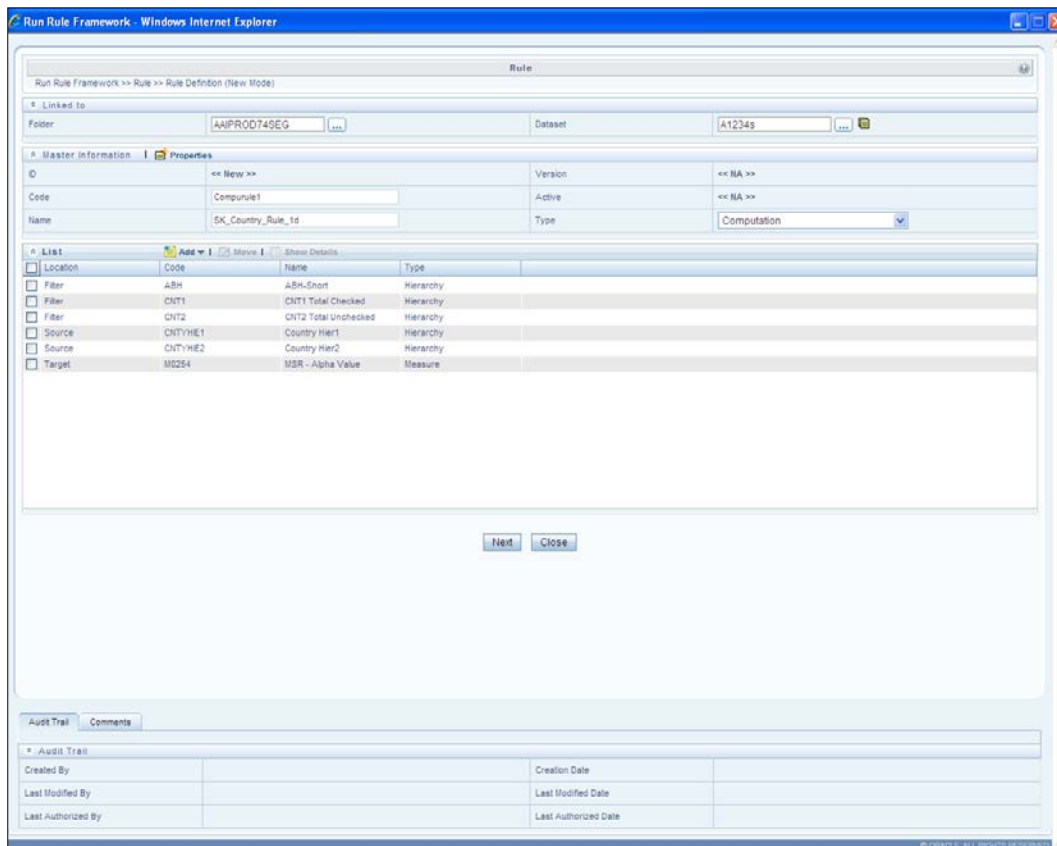
The Rules option in the Rules Framework provides a framework that facilitates the definition and maintenance of a transformation. The metadata abstraction layer is used in the definition of rules where the user is permitted to re-classify the attributes in the data warehouse model thus transforming the data. The underlying metadata objects such as Hierarchies that are non-large or non-list, Datasets and Business Processors drive the Rule functionality. You need to have PR2ADMIN function role mapped to access the Rule definition. The definition, modification, copy, and deletion of a Rule must be approved by an authorizer for the action to be effective. The *Rule* screen displays the rules created in the current Information Domain with the metadata details such as Code, Name, Description, Type, Folder, Dataset, Version, and Active status.


You can archive/restore the existing PR2 definitions using the Metadata Restore/Archive utility and also migrate PR2/RRF definitions through the Command Line Utilities across Information Domains / Setups.

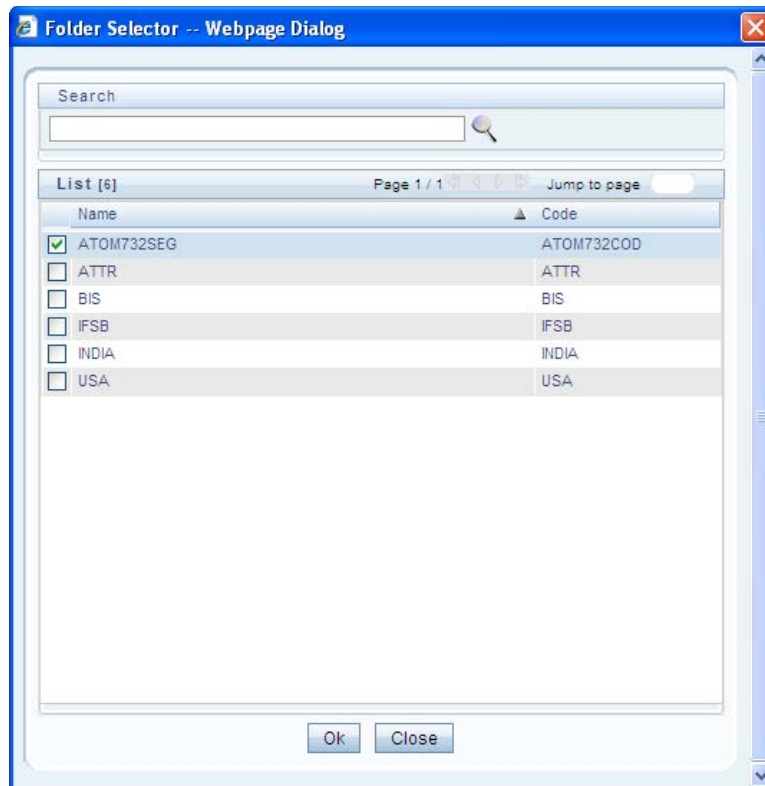
### Create Rule



You can create Rule definitions using the existing metadata objects. To create a Rule definition in the *Rule* screen:

1. Click  icon from the List toolbar. The *Rule Definition (New Mode)* screen is displayed.

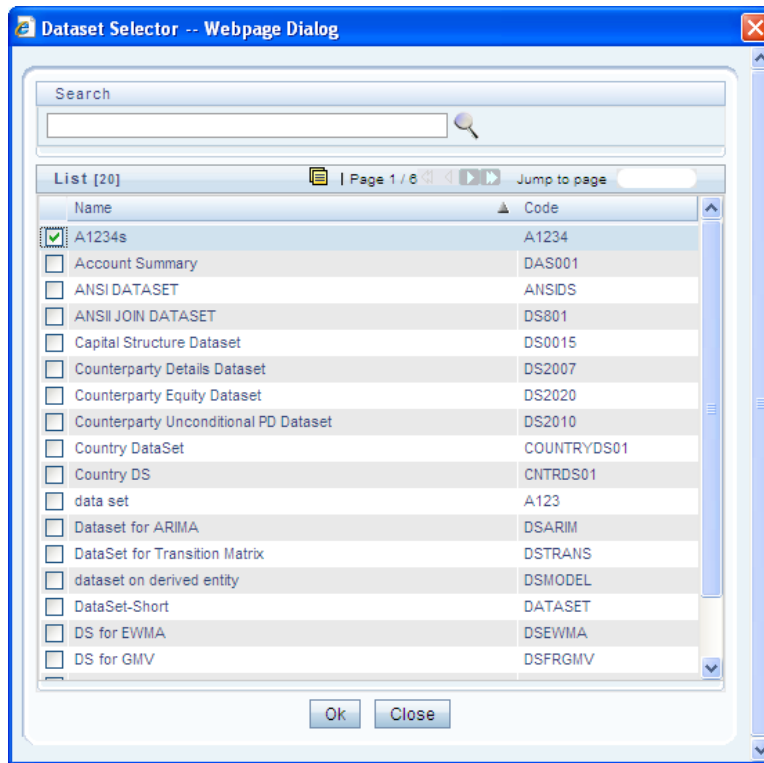




2. Click  icon in the adjacent to the Folder field in the *Linked to* grid. The *Folder Selector* dialog is displayed.



3. Select the checkbox adjacent to the required folder. Click **OK**. You can also enter a keyword and click the  icon in the Search field of *Folder Selector* dialog to locate a particular folder.
4. Click the  icon adjacent to the **Dataset** field in the *Linked to* grid. The *Dataset Selector* dialog is displayed with the list of datasets available under the selected folder.




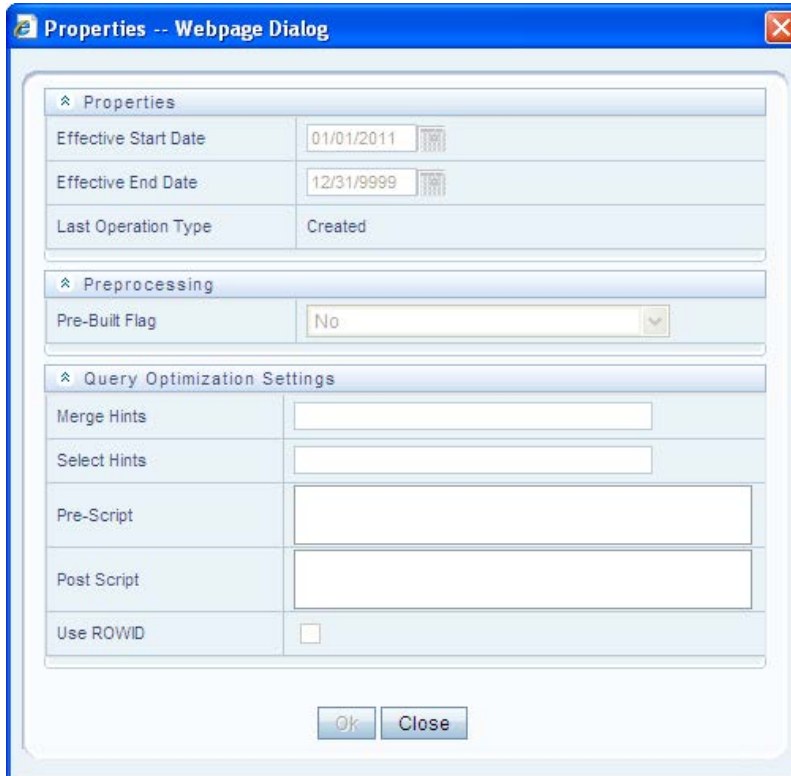


5. Select the checkbox adjacent to the required Dataset name. Click **OK**. In the *Dataset Selector* dialog, you can also do the following:
  - Search for a particular folder by specifying keyword and clicking  button.
  - View properties of the selected Dataset by clicking  button.
  - Make use of Pagination option to manage the view of existing Datasets within the system.
6. Enter the details in the *Master information* grid as tabulated below:



Field Name	Description
ID	Refers to the default ID of a newly created Rule and is <<New >>
Code	Enter a valid code for the Rule. Ensure that the code value specified is of maximum 30 characters in length and does not contain any special characters except “_”.
Name	Enter a valid name for the Rule.
Version	By default the version field is displayed as <<NA>> for the new Rule being created. Once the Rule definition is saved, an appropriate version is assigned as either “-1” or “0” depending on the authorization permissions.

Field Name	Description
Active	By default, the Active field is displayed as <<NA>> for the new Rule being created. Once the Rule definition is saved, the status is set to “Yes” if you are an <i>Authorizer</i> creating the Rule or “No” if the created Rule needs to be Authorized by an <i>Authorizer</i> .
Type	Select the “Type” based on which you would like to create the rule from the dropdown list. You can select either <b>Computation</b> or <b>Classification</b> .

- Click  icon in the *Master info* grid. The *Properties* dialog is displayed.



The *Properties* dialog lists the Rule Properties, Preprocessing status, and Query Optimization Settings as tabulated below. The data in *Query Optimization Settings* are derived from the global properties (if defined) in the *Optimization* tab of *System Configuration > Configuration* screen. However, some options defined in Global Preferences precede the Rule level properties that you define here.

Field Name	Description
<b>Properties</b>	
Effective Start Date	Select the Effective Start Date by clicking  icon.
Effective End Date	Select the Effective End Date by clicking  icon.

Field Name	Description
Last operation type	By default, this field displays the last change done to the Rule definition. While creating a Rule, the field displays the operation type as <b>Created</b> .
<b>Pre processing</b>	
Pre Built Flag	<p>Pre Built Flag refers to the pre-compiled rules, which are executed with the query stored in database. While defining a Rule, you can make use of Pre Built Flag to fasten the Rule execution process by making use of existing technical metadata details wherein the rule query is not rebuilt again during Rule execution.</p> <p>By default, Pre Built Flag status is set to “<b>No</b>”. This indicates that the query statement is formed dynamically retrieving the technical metadata details. If the Pre Built Flag status is set to “<b>Yes</b>” then the relevant metadata details required to form the rule query is stored in database on “Save” of a Rule definition. When this rule is executed, database is accessed to form the rule query based on stored metadata details, thus ensuring performance enhancement during Rule execution.</p> <p>Select the required option from the drop down list.</p>
<b>Query Optimization Settings</b>	
Merge Hints	<p>Specify the SQL Hint that can be used to optimize Merge Query.</p> <p>For example, “/*+ ALL_ROWS */”</p> <p>In a Rule Execution, Merge Query formed using definition level Merge Hint precede over the Global Merge Hint Parameters defined in the <i>Optimization</i> tab of <i>System Configuration &gt; Configuration</i> screen. In case the definition level Merge Hint is empty / null, Global Merge Hint (if defined) is included in the query.</p>
Select Hints	<p>Specify the SQL Hint that can be used to optimize Merge Query by selecting the specified query.</p> <p>For example, “SELECT /*+ IS_PARALLEL */”</p> <p>In a Rule Execution, Merge Query formed using definition level Select Hint precede over the Global Select Hint Parameters defined in the <i>Optimization</i> tab of <i>System Configuration &gt; Configuration</i> screen. In case the definition level Select Hint is empty / null, Global Select Hint (if defined) is included in the query.</p>

Field Name	Description
Pre Script	<p>Refers to a set of semicolon (;) separated statements which are to be executed <b>before</b> Merge Query on the same connection object.</p> <p>In a Rule Execution, Global Pre Script Parameters (defined in <i>Configuration</i> screen) are added to a Batch followed by Rule definition level Pre Script statements if the same has been provided during rule definition. However, it is not mandatory to have a Pre Script either at Global or definition level.</p>
Post Script	<p>Refers to a set of semicolon (;) separated statements which are to be executed <b>after</b> Merge Query on the same connection object.</p> <p>In a Rule Execution, Global Post Script Parameters (defined in <i>Configuration</i> screen) are added to a Batch followed by Rule definition level Post Script statements if the same has been provided during rule definition. However, it is not mandatory to have a Post Script either at Global or definition level.</p>
Use ROWID	<p>You can select the ROWID checkbox to create a Merge Statement based on ROWID instead of Primary Keys.</p> <p>In a Rule Execution, ROWID is considered while creating Merge Statement if <b>Use ROWID</b> checkbox is selected in either Global Parameters (<i>Configuration</i> screen) or Rule definition properties.</p> <p>If <b>Use ROWID</b> checkbox is not selected in either Global Parameters (<i>Configuration</i> screen) or Rule definition properties, then the flag is set to "N" and Primary Keys are considered while creating in Merge Statements.</p>

8. Click **OK**. The properties are saved for the current Rule definition.

### ***Add Members to Filter***



You can define filters for a Rule definition such as Hierarchy, Filter-Data Element, Filter-Hierarchy, or Filter Group.

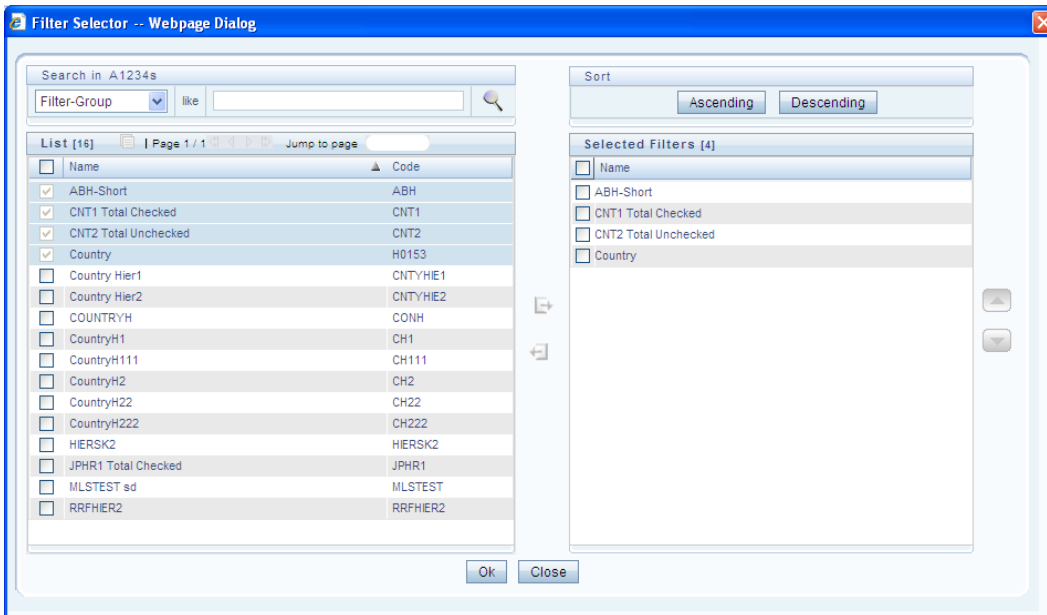
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**NOTE:** In order to access *Filter Selector* screen and to select the pre-defined filters, you need to have **FILTERRULE** function mapped to your role.

---

To create a filter for a Rule in the *Rule Definition (New Mode)* screen:


1. Click  icon from the *List* grid and click the  icon. The *Filter Selector* screen is displayed.



The LHS pane of the *Filter Selector* screen displays the available members under the selected Information Domain and Dataset.

2. Select any of the following filters from the *List* grid drop down list to sort the members:

Member Type	Description
Hierarchy	<b>Hierarchy</b> refers to the defined Business Hierarchies and will list all the UMM Hierarchies pertaining to the selected dataset.
Filter-Data Element	<b>Data Element Filter</b> is a stored rule that expresses a set of constraints. Only columns that match the data type of your Data Element selection are offered in the Data Element drop down list box.
Filter-Hierarchy	<b>Hierarchy Filter</b> allows you to utilize rollup nodes within a Hierarchy to help you exclude (filter out) or include data within an OFSAA rule.
Filter-Group	<b>Group Filters</b> can be used to combine multiple Data Element Filters with a logical "AND".


3. Select the checkbox adjacent to the members you want to select.
4. Click  icon to move the selected members to the **Selected Filters** pane.





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**NOTE:** You can select maximum of nine Filters for a Rule.

---



In *Filter Selector* screen you can:

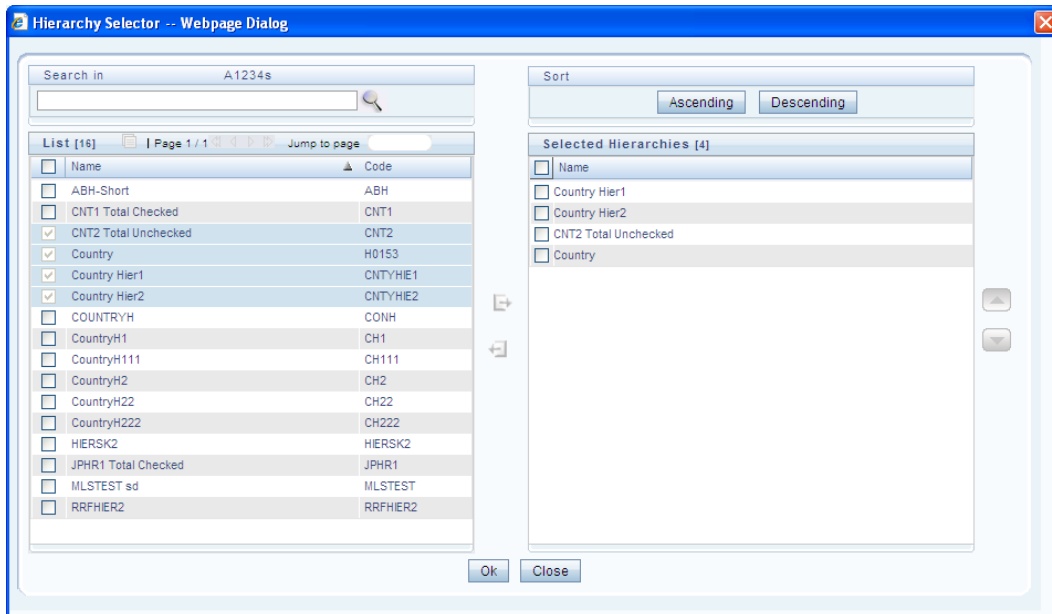
- o You can search for a specific member type by selecting from the drop-down list and clicking  button. You can also modify your search criteria specifying the nearest keyword in the **like** field.

- The Pagination option helps you to manage the view of existing Hierarchies within the system.
  - Click  button to view the details of a selected member.
  - Click **Ascending** or **Descending** button to sort the selected components in Ascending or Descending order.
  - Click  or  button to re-arrange the selected list of members.
5. Click  button to remove selected members from the Selected Filters pane. Click **OK**. The selected filters are listed in the *Rule Definition (New Mode)* screen.


### Add Hierarchies to Source

The Source and Target can be selected from the *List* grid. To select the Source for a Rule in the *Rule Definition (New Mode)* screen:



1. Click the  icon from the *List* grid and select . The *Hierarchy Selector* screen is displayed.






The LHS pane of the *Hierarchy Selector* screen displays the available hierarchies under the selected Folder.

2. Select the checkbox adjacent to the Hierarchies you want to select as Source.
3. Click  icon to move the selected hierarchies to the Selected Hierarchies pane.



You can select maximum of nine Sources for a Rule. In *Hierarchy Selector* screen you can:

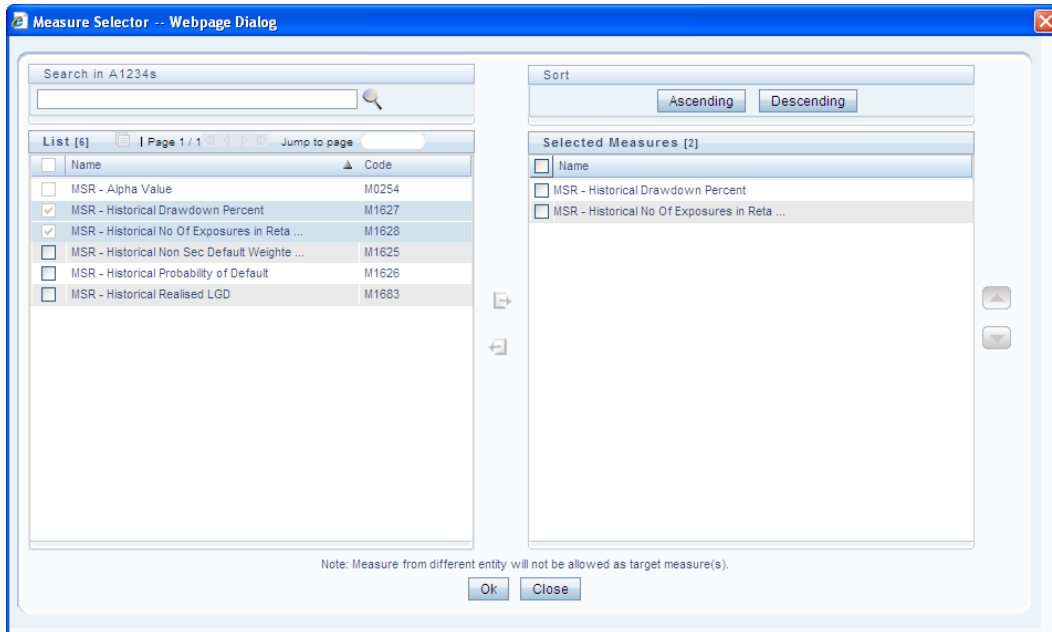
- Search for a member by specifying the nearest keyword and clicking  button.
- The Pagination option helps you to manage the view of existing Hierarchies within the system.
- Click  button to view the details of a selected hierarchy.

- Click **Ascending** or **Descending** button to sort the selected components in Ascending or Descending order.
  - Click  or  button to re-arrange the selected list of hierarchies.
  - Click  button to remove selected hierarchies from the Selected Hierarchies pane.
4. Click **OK**. The selected hierarchies are listed in the *Rule Definition (New Mode)* screen.


### Add Measures / Hierarchies to Target

To select the Target for a Rule in the *Rule Definition (New Mode)* screen:

1. Click the  icon from the *List* grid and select  icon. The *Measure Selector / Hierarchy Selector* screen is displayed. The *Measure Selector* and *Hierarchy Selector* screens are displayed depending on the Type of the Rule you have selected, i.e. the Computation Rule and Classification Rule respectively.



The LHS pane of the *Measure Selector / Hierarchy Selector* screen displays the available Measures / Hierarchies under the selected Information Domain and Dataset.


2. Select the checkbox(s) adjacent to the members you want to select as Target.
3. Click  icon to move the selected measures to the Selected Measures / Selected Hierarchies pane:

---





**NOTE:** Measures from different entities are not allowed as target measures. You can select maximum of five measures and a single Hierarchy to the target.

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In *Measure Selector / Hierarchy Selector* screen you can:

- Search for a member by specifying the nearest keyword and clicking  button.
- The Pagination option helps you to manage the view of existing members within the

system.

- Click  button to view the details of a selected member.
  - Click **Ascending** or **Descending** button to sort the selected components in Ascending or Descending order.
  - Click  or  button to re-arrange the selected list of members.
  - Click  button to remove selected measures from the Selected Measures / Selected Hierarchies pane.
4. Click **OK**. The selected members are listed in the *Rule Definition (New Mode)* screen.

In the List grid you can also:

- Click  icon to move a selected member between **Filter**, **Source**, or **Target**.
- Click  icon to view the selected member details.

Once all the necessary information in the first screen of the *Rule Definition (New Mode)* is populated, click **Next** button to navigate to the concurrent procedures of defining a Rule.

### ***Hierarchical Member Selection***


The second screen of *Rule Definition (New Mode)* screen displays all the information you have provided in the *Linked to* and *Master info* grids. You can view the filters you have selected in the *Rule Condition* grid. In the *Rule Condition* grid, you can apply conditions for each of the BMM hierarchy filters.

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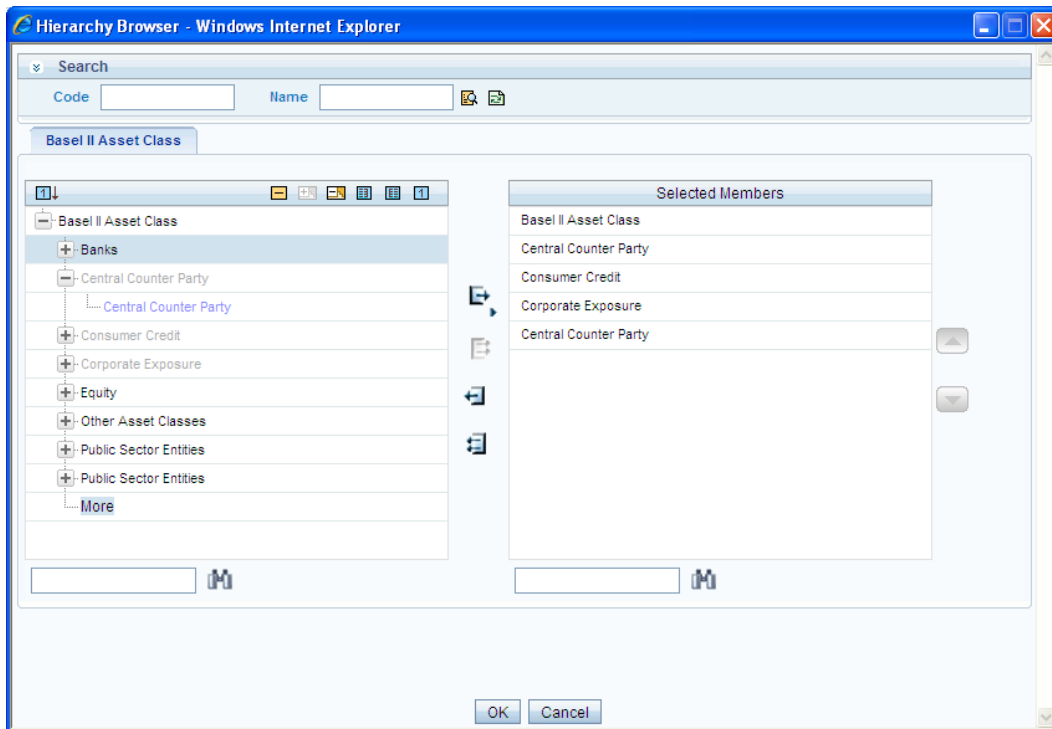
**NOTE:** In case of Data Element, Group, or Hierarchy filters, you can only view the SQL query.

---

To apply condition for a BMM hierarchy filter and view the SQL query in the *Rule Condition* grid:

1. Click  button adjacent to the filter details. The *Hierarchy Browser* screen is displayed.





The *Search* grid allows you to search for a particular member by entering Code or any part of the Name and clicking button. You can click button to refresh the Code or name fields. You can also find a member in the grid using button.



2. Click and expand the members of the selected hierarchy.
3. Select a member / node and click to select the same. Click the to select the member as Self or Parent. In the *Hierarchy Browser* screen you can also:
  - Click or to sort the members by Code or Name.
  - Click or to expand or collapse the members under a node.
  - Click or to expand a branch or collapse a branch.
  - Click or to view the code values of members right or left.
  - Click or to show code or show name of the members.

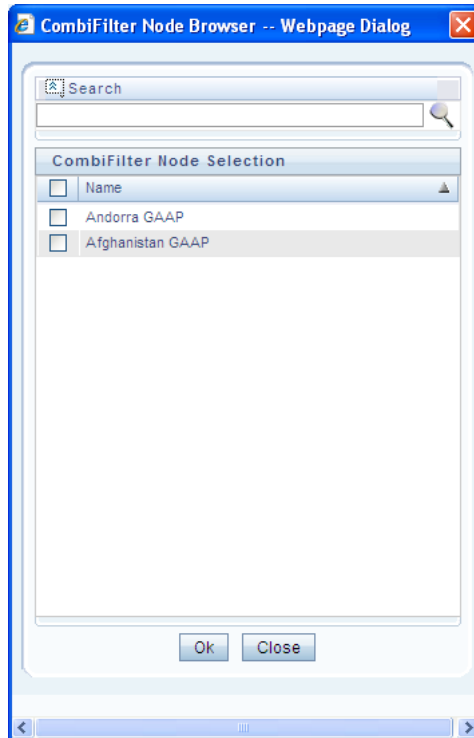
Click or to re-arrange the members in the Selected Members pane. However, the rearranged members are not displayed on the *Combination Mapper* grid based on the reordering.

4. Click button adjacent to a filter details. The *Preview SQL Query* screen is displayed with the resultant SQL query.

### ***Move Source to Slicer***

The selected Source and Target Hierarchies are displayed under *Combination Mapper* grid. You can move the source Hierarchies from *Combination Mapper* grid to *Slicer*. To move a source Hierarchy from *Combination Mapper* grid to *Slicer* grid:


1. Click the Hierarchy member and drag it to the *Slicer* grid. The member is displayed under *Slicer* grid.
2. Click  button to select the members of a Hierarchy. The Hierarchy Browser is displayed.
3. Click  button. The *CombiFilter Node Browser* screen is displayed.

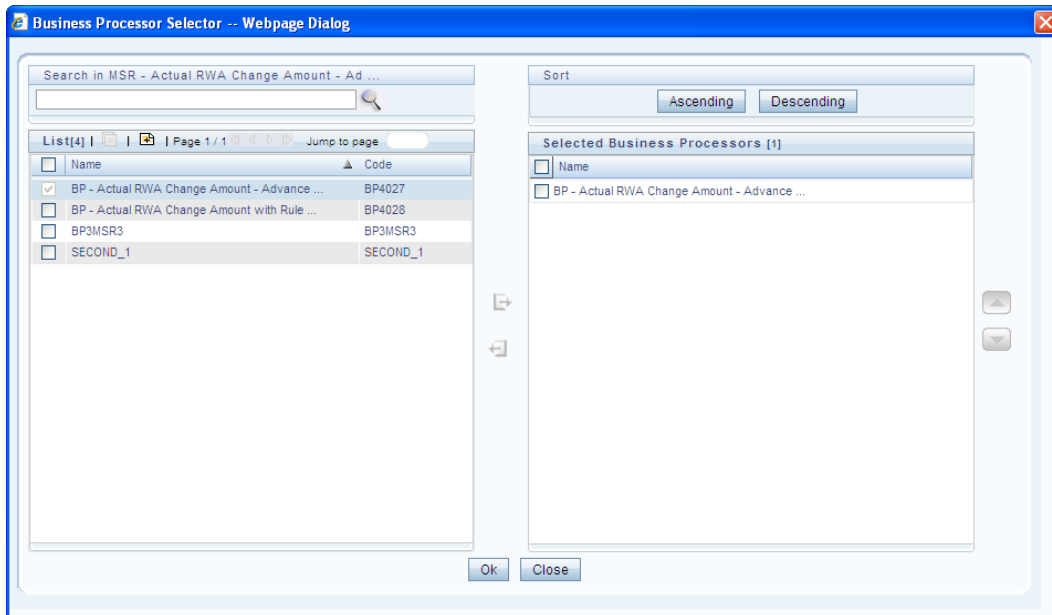


4. Select the checkbox adjacent to the member name and click **OK**.

### ***Select Business Processor as Target***








The Measures selected as target are displayed under Target page in the *Combination Mapper* grid. You can select the Business Processors (BP) from these Measures. To select the Business Processors form a Measure:


1. Click  button in the Measure displayed under Target page. The *Business Processor Selector* screen is displayed.



2. Select the checkbox adjacent to the Business Processor name and click .

In Business Processor Selector screen you can:

- Search for a Business Processor by specifying the nearest keyword and clicking  button.
  - The Pagination option helps you to manage the view of existing Business Processors within the system.
  - Click  button to view the details of a selected Business Processor.
  - Click  button to define a new Business Processor.
  - Click **Ascending** or **Descending** button to sort the selected components in Ascending or Descending order.
  - Click  or  button to re-arrange the selected list of Business Processors.
  - Click  button to remove the selected Business Processors from **Selected Business Processors** pane.
3. Click **OK**. The selected Business Processors are listed under the *Combination Mapper* grid along with the **Source** and **Filter** definition details.(Optional) After selecting Business Processor(s) in the *Combination Mapper* grid, you can set the Default Target member, specify Parameters, and exclude child nodes for the Rule definition.
    - You can set the selected Target member as default by clicking  button on the header bar of required Business Processor and selecting **Default Member** checkbox. When a Target member is selected as default, all the unmapped Source member combinations for that Target object will be logically mapped to the default member and the corresponding target appears disabled. Run time parameters cannot be applied for such defaulted target BP's. However, the logical mappings will not overwrite the physical mapping.
    - You can specify parameters for the selected Business Processor. Select the checkbox(s)

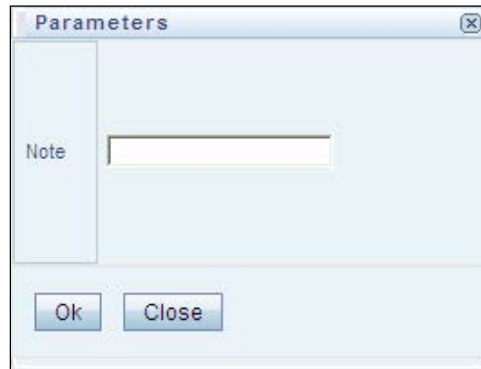
adjacent to the required Business Processor and click  button adjacent to a checkbox selected. The *Parameters* pop-up is displayed.

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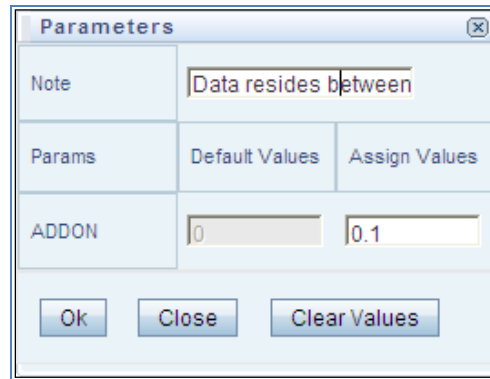
**NOTE:** A physical mapping is established when mapping is explicitly done upon a combination of source and target members.


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- For a Classification Rule and Computation Rule with non-parameterized BP, the Parameters pop-up is as displayed. Enter the required note in the text field and click **OK**.



- For a Computation Rule with parameterized BP, the Parameters pop-up is as displayed. Enter the required note in the text field. The *Parameter Default Value* is fetched from the *Business Processor* definition and the *Assign Value* can be entered manually which is considered during Rule execution at Runtime. You can also clear the *Assign Value* field by clicking the **Clear Values** button. Click **OK**.

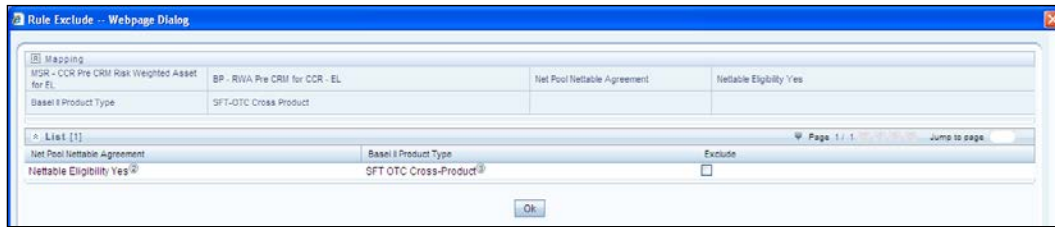


- You can exclude child node(s) in the *Combination Mapper* grid, if they are not required in the Rule execution. Click  (Exclude) button. The *Rule Exclude* screen is displayed.

---


**NOTE:** The exclude icon is available only for the combinations with physical mappings. When a default member is removed from the target member, all logical mappings would be removed retaining only physical mappings.


---



- The *Rule exclude* screen displays only the child nodes associated to a Parent node. Ensure that the selected parent has associated child nodes and is not the default member in the target.
- Select the checkbox adjacent to Rule code that you want to exclude and click **OK**.

Once all the necessary details are entered, click **Save**. The Rule definition is saved with the provided details and is displayed in the *Rule* screen. The default version of a new Rule definition created by an Authorizer is “0” and the one created by non-authorizer is “-1”. The *Audit Trail* section at the bottom of *Rule Definition (New Mode)* screen displays metadata information about the Rule definition created. The *User Comments* section facilitates you to add or update additional information as comments.

You can view individual Rule definition details at any given point. To view the existing Rule definition details in the *Rule* screen select the checkbox adjacent to the Rule Code whose details are to be viewed. Click  button in the List tool bar. The *Rule Definition (View Mode)* screen is displayed with all the details of the selected Rule. Click **Next** and **Back** buttons to navigate back and forth in the *Rule Definition (View Mode)* screen.


You can Modify all the details except ID, Code, Version, Active, and Type of a Rule definition. To modify an existing Rule definition in the *Rule* screen, select the checkbox adjacent to the Rule Code whose details are to be updated. Click  button in the *List* tool bar.

### ***Rule Definition Versioning***

The default version of a new Rule definition created by an Authorizer is "0" and the one created by non Authorizer is "-1". When you edit and save a Rule, you are prompted either to overwrite the already existing details and save the same as latest version (version "0") or to create a subsequent version wherein the existing details are retained as of current version +1. Note that a definition with version "-1", when edited by an authorized user changes to "0" and an unauthorized user remains as "-1".

### **Copy Rule Definition**

The Copy Rule Definition facilitates you to quickly create a new Rule Definition based on an existing Rule or by updating the values of the required Rule. To copy an existing Rule Definition in the *Rule* screen:


1. Select the checkbox adjacent to the Rule Code whose details are to be duplicated.
2. Click  button in the List toolbar to copy a selected Rule definition. The *Rule Definition (Copy Mode)* screen is displayed. Copy button is disabled if you have selected multiple Rules. In the *Rule Definition (Copy Mode)* screen you can:
  - Create new Rule definition with existing variables. Specify a new **Rule Code** and **Folder**. Click **Save**.
  - Create new Rule definition by updating the required variables. Specify new **Rule Code**, **Folder**, and update other required details. Click **Save**.


The new Rule definition details are displayed in the *Rule* screen. By default, version “0” is set if you have authorization rights, else the version is set to “-1”.

## Authorize Rule Definition

A Rule definition when created/modified should be approved by an authorizer. An authorizer can Approve/Reject a pre-defined Rule definition listed within the *Rule* screen. To Approve/Reject Rule(s) in the *Rule* screen, you need to have Authorizer function mapped to your role. If you are an authorizer, then all the Rule definitions created/modified by you are auto Approved and the Active status is set to “Yes”. Else, the Active status is set to “No” and can be authorized.

Select the checkbox(s) adjacent to the required Rule Code(s). Do one of the following:



To **Approve** the selected Rule definitions, click  button.

To **Reject** the selected Rule definitions, click  button.

A Rule is made available for use only after the approval. For a rejected definition a comment with the rejection details will be added.

## Export Rule to PDF

You can export single/multiple Rule definition details to a PDF file. To export the Rule definition details in the *Rule* screen:


1. Select the checkbox(s) adjacent to the Rule Code(s) you want to export.
2. Click  button in the List toolbar.
3. Click the  button in the popup. The *Export* dialog is displayed.




The *Export* dialog displays the Export Format, Definition Type, and the names of the Selected Definitions. Click **Export**. The process is initiated and is displayed in a pop-up specific to the current download. Once the pdf is generated, you can open / save the file from the *File Download* dialog. You can either save the file on the local machine or view the file contents in a PDF viewer. The downloaded PDF displays all the details such as Linked to, Properties, Master info, Audit Trail, List, Mapping Details, and Comments of all the Rule definitions selected.

## Trace Rule Definition Details

You can trace the metadata details of individual Rule definitions. To trace the underlying metadata details of a Rule definition in the *Rule* screen:


1. Select the checkbox adjacent to the Rule Code whose details are to be traced.
2. Click  button from the List toolbar.

The *Trace Definition* screen is displayed with the details such as Traced Object (Name and definition type)

and Processes and Runs in which the selected Rule is used. In the *Trace Definition* screen you can also select individual Process or Run and click  button to view the definition details.

## Delete Rule Definition

You can remove Rule definition(s) which are no longer required in the system by deleting from *Rule* screen.

1. Select the checkbox(s) adjacent to the Rule Code(s) whose details are to be removed.
2. Click  button from the List tool bar.
3. Click **OK** in the information dialog to confirm deletion.

An information dialog is displayed confirming the deletion of the Rule definition(s) and asking the authorization.

## 2.4.2 Process

A set of rules collectively form a Process. A process definition is represented as a Process Tree. The Process option in the Rules Framework provides a framework that facilitates the definition and maintenance of a process. By defining a Process, you can logically group a collection of rules that pertain to a functional process.

You can define a Process with the existing metadata objects using a hierarchical structure which facilitates the construction of a process tree. Process tree can have many levels and one or many nodes within each level. Sub-processes are defined at level members and process hierarchy members form the leaf members of the tree.

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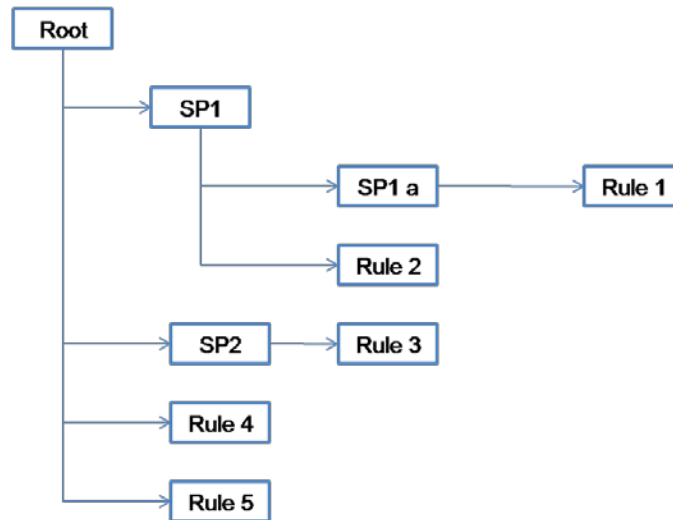
### NOTE:

- Precedence defined to each Process determines the Process Initiation Sequence.
  - If Precedence is defined, Process Execution (along with the associated Rules) happens based on the precedence defined to each component.
  - If no precedence is defined, all the processes within the process tree are initiated together in its natural hierarchical sequence.
- 

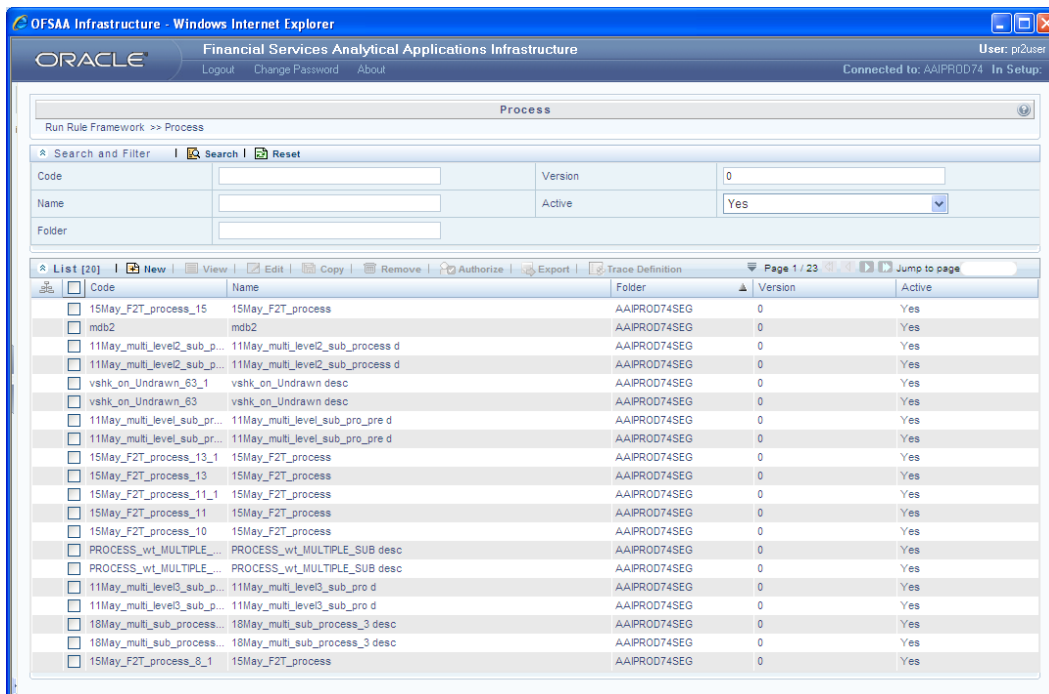
Consider the following illustration:

If natural Precedence is defined to the sub process **SP1**, Process Execution is triggered in the sequence Rule 1 > SP1a > Rule 2 > SP1.

If no precedence is defined, all the sub processes SP1, SP2, Rule 4, and Rule 5 are executed in parallel.



Further, the business may require simulating conditions under different business scenarios and evaluate the resultant calculations with respect to the baseline calculation. Such simulations are done through the construction of Processes and Process trees. Underlying metadata objects such as Rules, T2T Definitions, Processes, and Database Stored Procedures drive the Process functionality.




The *Process* screen displays the processes created in the current Information Domain with the metadata details such as Code, Name, Folder, Version, and Active. You can archive/restore the existing PR2 definitions using the Metadata Restore/Archive utility and also migrate PR2/RRF definitions through the Command Line Utility across Information Domains / Setups.

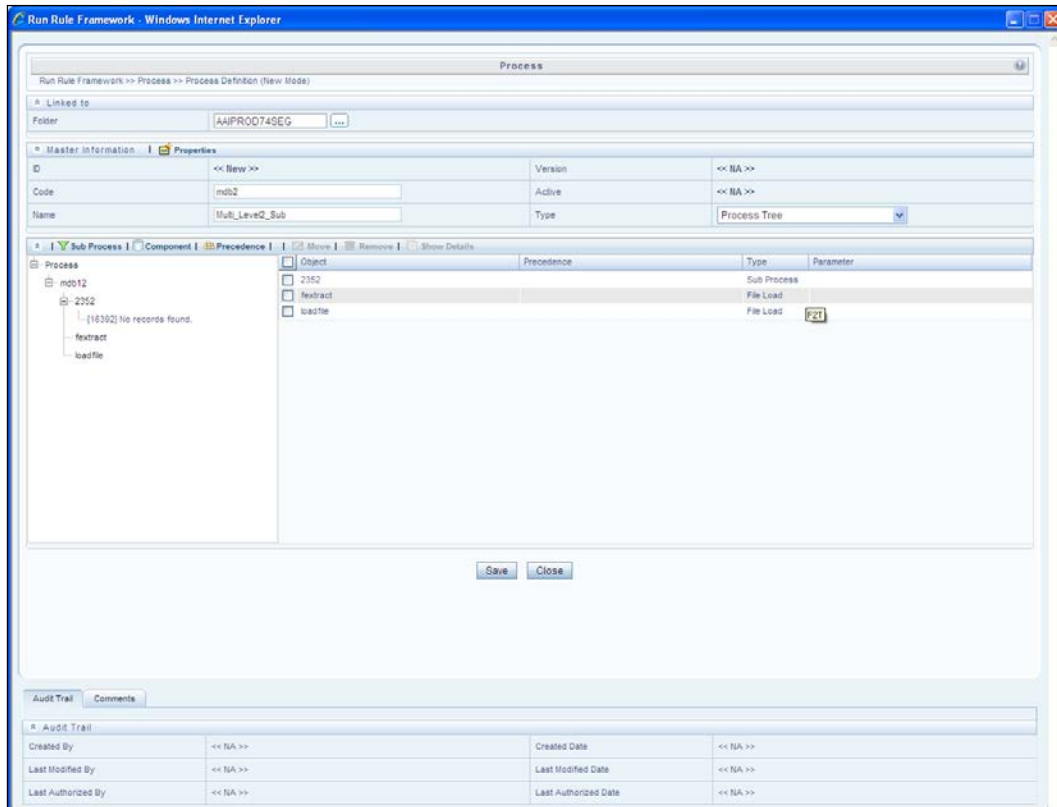
### Create Process


You can build a Process by adding one or more members called Process Nodes. If there are Predecessor Tasks associated with any member, the tasks defined as predecessors precede the execution of that member.

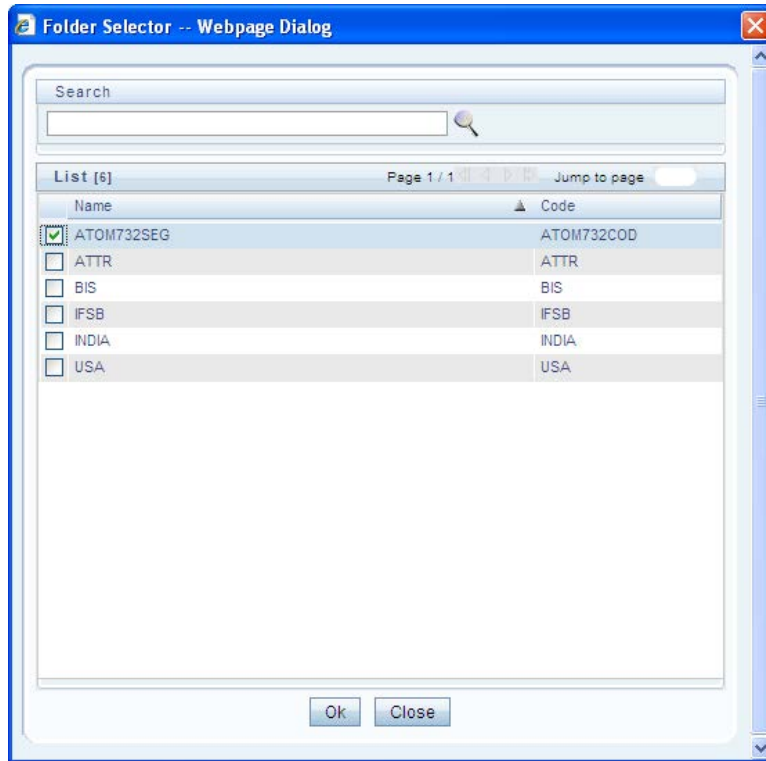


To define a process in the *Process* screen:


1. Click  button from the List toolbar. The *Process Definition (New Mode)* screen is displayed.



2. Click  button adjacent to the **Folder** field in the *Linked to* grid. The *Folder Selector* dialog is displayed.




3. Select the checkbox adjacent to the required folder. Click **OK**.

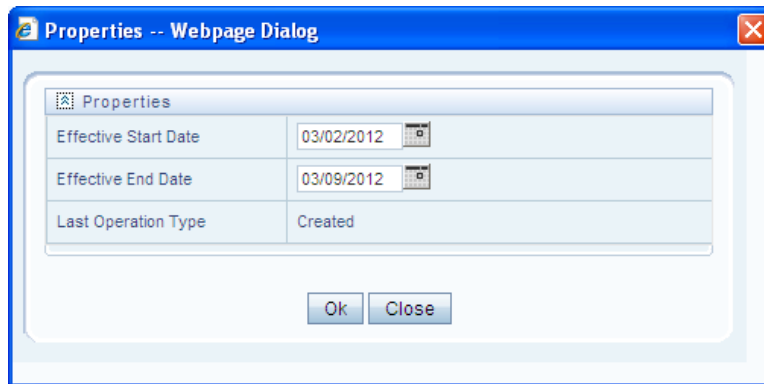
You can also enter a keyword and click  button in the Search field of *Folder Selector* dialog to locate a particular folder. The Pagination option helps you to manage the view of existing Folders within the system.

4. Enter the details of the *Master info* grid as tabulated below:



Field Name	Description
ID	Refers to the default ID of a newly created Process and is <<New>>
Code	Enter a valid code for the Process. Ensure that the code value specified is of maximum 30 characters in length and does not contain any special characters except “_”.
Name	Enter a valid name for the Process.
Version	By default the version field is displayed as <<NA>> for the new Process being created. Once the Process definition is saved, an appropriate version is assigned as either “-1” or “0” depending on the authorization permissions.
Active	By default, the Active field is displayed as <<NA>> for the new Process being created. Once the Process definition is saved, the status is set to “Yes” if you are an Authorizer creating the Rule or “No” if the created Rule needs to be Authorized by an <i>Authorizer</i> .

Field Name	Description
Type	Select the "Type" based on which you would like to create the rule from the dropdown list.

- Click  button in the *Master info* grid. The *Properties* dialog is displayed.




- You can edit the below tabulated details in the *Properties* dialog:

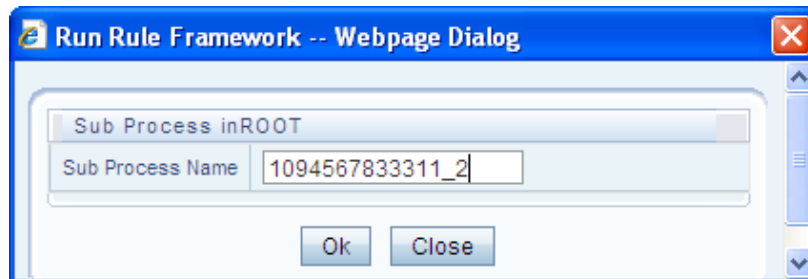
Field Name	Description
Effective Start Date	Select the Effective Start Date by clicking  (Calendar) button.
Effective End Date	Select the Effective Start Date by clicking  (Calendar) button.
Last operation type	By default, this field displays the last change done to the Process definition. While creating a Process, the field displays the operation type as <b>Created</b> .

- Click **OK**. The properties are saved for the current Process definition.

### Define Sub Process to Root

You can define sub processes to the base process being created or for a pre-defined sub process under a base process. To create a sub processor in the *Process Definition (New Mode)* screen:

- Click  (Sub process) button. The *Sub Process in ROOT* dialog is displayed.



- Enter the Sub Process Name and click **OK**.

The sub process is listed under the root process as a branch.


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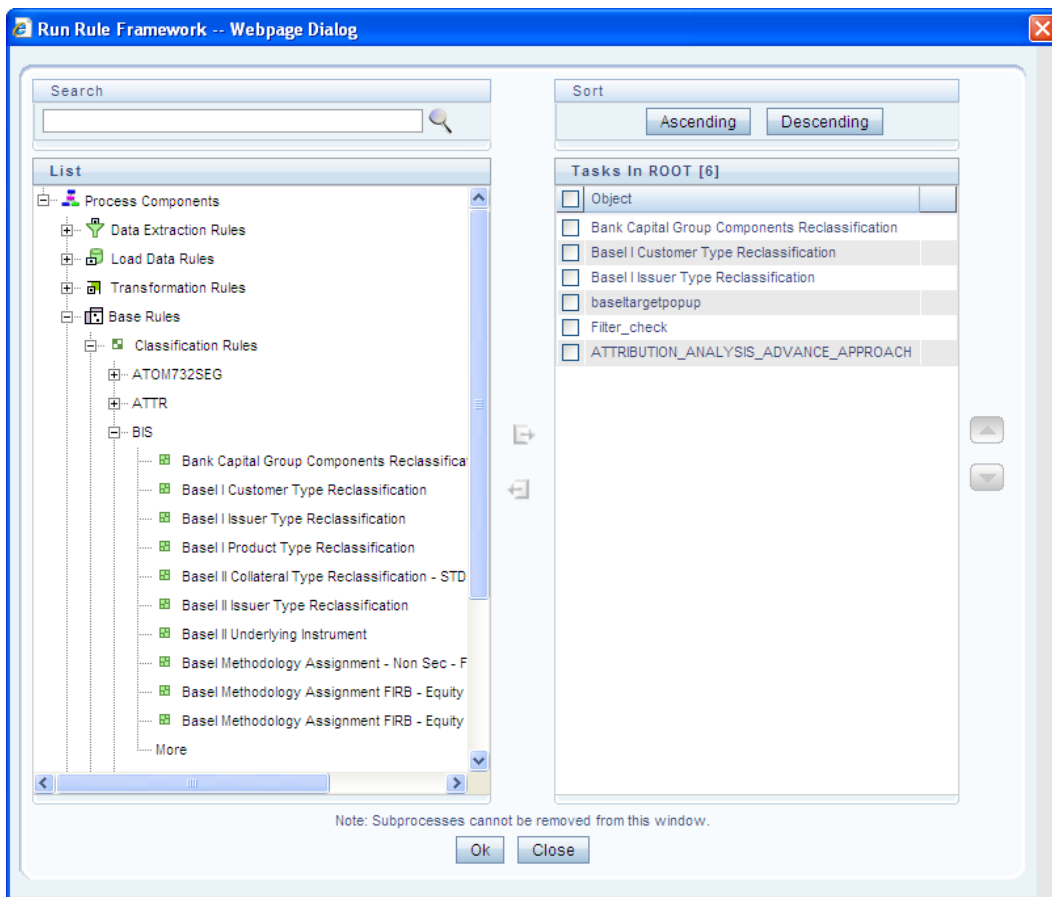
**NOTE:** You can further create sub processes for the existing processes or for the base process by selecting the process and following the above procedure.


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### Add Component to Base Process / Sub Process





You can add process components to the base process as well as the sub processes. To add the process components from the *Process Definition (New Mode)* screen:

1. Select the process on which you want to add the component.
2. Click  (Component) button. The *Component Selector* screen is displayed.



On the List pane of the *Component Selector* screen, you can click  button to expand the members and view the process components.

3. Select a Process Component and click  to move the component to the *Tasks In <Process Name>* pane. In *Component Selector* screen you can also:
  - Search for a component by specifying the nearest keyword and clicking  button.
  - Click **Ascending** or **Descending** button to sort the selected components in Ascending or Descending order.

- Click  or  button to move up or move down the selected components.
- Click  button to add parameters for the selected components.
- The parameters must be specified in double quotes and in case of multiple parameters, specify the values separated by commas. E.g.: "value 1","value 2".
- Click  button to remove selected components from the *Tasks In <Process Name>* pane.

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**NOTE:** Sub processes listed in *Tasks In <Process Name>* pane cannot be removed.

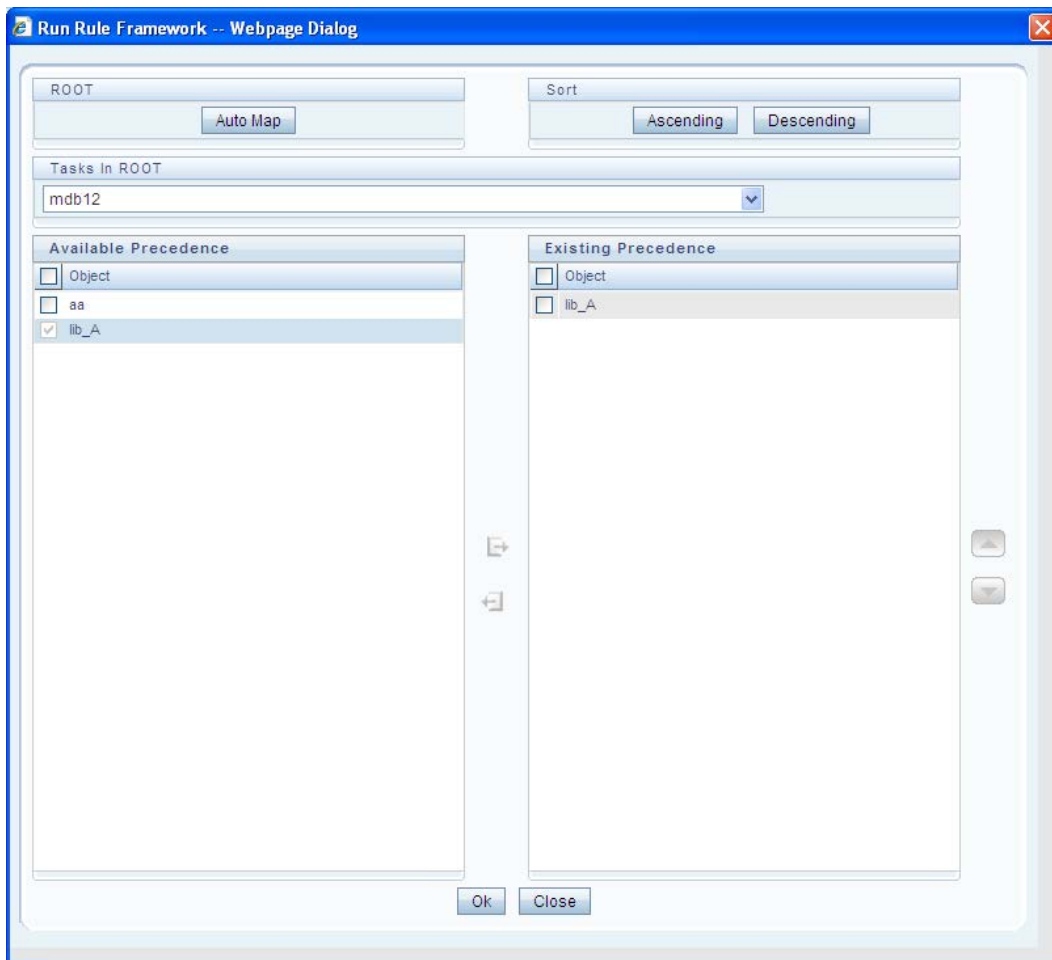
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4. Click **OK**. The components are listed under the selected process.

### ***Add Precedence for the Selected Components***


You can add precedence for the selected components in the *Process Definition (New Mode)* screen. Precedence can be defined to peer processes in a selected parent process. To add precedence for a selected component:

1. Select the process for whose components you want to select precedence.
2. Click  (Precedence) button. The *Precedence Selector* screen is displayed.



3. Select **Auto Map** to override the predefined precedence and to set predecessor tasks as precedence.

To manually select predecessor tasks for a task:




- Select a task from **Tasks In <Process Name>** dropdown box. The other tasks are listed in the Available Precedence pane.
- Select the tasks to set as predecessor tasks and click  button.
- The selected tasks are listed in the **Existing Precedence** pane.

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**NOTE:** You cannot select tasks as predecessor tasks if they have cyclic dependencies with the selected task.


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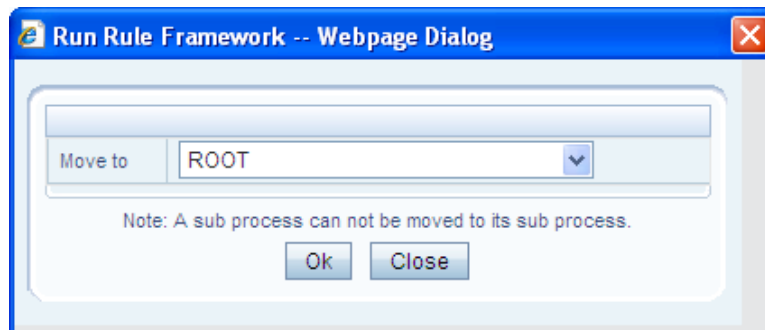
In the *Precedence Selector* screen you can also:

- Click **Ascending** or **Descending** button to sort the selected tasks in Ascending or Descending order.
  - Click  or  button to move up or move down the selected tasks.
  - Click  button to remove selected tasks from the **Existing Precedence** pane.
4. Click **OK**. The precedence is set for the tasks in the selected process.

### ***Move Tasks among Processes***

You can move the tasks which has no dependency, among different processes in the *Process Definition (New Mode)* screen. To move tasks:

1. Select the checkbox(s) adjacent to the tasks to move to a different process.
2. Click  button. The *Move to* dialog is displayed.





3. Select the process / subprocess to which you want to move the task.
4. Click **OK**. The screen is refreshed and the task is displayed under the selected process.

### ***Remove Tasks from a Process***

You can remove / delete the tasks which have no dependency, from the *Process Definition (New Mode)* screen. To remove tasks:


1. Select the checkbox(s) adjacent to the tasks you want to remove.


2. Click  button. The Warning dialog is displayed.
3. Click OK. The selected tasks are removed from the process.

In the *Process Definition (New Mode)* screen, you can also view the details of a selected task by clicking  button.

4. Click **Save**. The process definition is saved with the provided details and is displayed in the *Process* screen.

The default version of a new Process definition created by an Authorizer is “0” and the one created by non Authorizer is “-1”. The *Audit Trail* section at the bottom of *Process Definition (New Mode)* screen displays metadata information about the Process definition created. The *User Comments* section facilitates you to add or update additional information as comments.

You can view individual Process definition details at any given point. To view the existing Process definition details in the *Process* screen, select the checkbox adjacent to the Process Code whose details are to be viewed. Click  button in the List tool bar. The *Process Definition (View Mode)* screen is displayed with all the details of the selected Process.


You can modify all the details except ID, Code, Version, Active status, and Type of a Process definition. To modify an existing Process definition in the *Process* screen, Select the checkbox adjacent to the Process Code whose details are to be updated. Click  button in the List tool bar. Edit button is disabled if you have selected multiple Processes.

### ***Process Definition Versioning***

The default version of a new Process definition created by an Authorizer is "0" and the one created by non Authorizer is "-1". When you edit and save a Process, you are prompted either to overwrite the already existing details and save the same as latest version (version "0") or to create a subsequent version wherein the existing details are retained as of current version +1.

Note that a definition with version "-1", when edited by an authorized user changes to "0" and an unauthorized user remains as "-1".

### **Copy Process Definition**

The Copy Process Definition facilitates you to quickly create a new Process Definition based on an existing Process or by updating the values of the required Process. To copy an existing Process Definition in the *Process* screen, select the checkbox adjacent to the Process Code whose details are to be duplicated. Click  button in the *List* toolbar to copy a selected Process definition. The *Process Definition (Copy Mode)* screen is displayed. Copy button is disabled if you have selected multiple Processes. In the *Process Definition (Copy Mode)* screen you can:



- Create new Process definition with existing variables. Specify a new **Process Code** and **Folder**. Click **Save**.
- Create new Process definition by updating the required variables. Specify a new **Process Code**, **Folder**, and update other required details. Click **Save**.

The new Process definition details are displayed in the *Process* screen. By default, version “0” is set if you have authorization rights, else the version is set to “-1”.

### **Authorize Process Definition**

A Process definition when created/modified should be approved by an authorizer. An authorizer can Approve/Reject a pre-defined Process definition listed within the *Process* screen. To Approve/Reject Process(s) in the *Process* screen, you need to have Authorizer function mapped to your role. If you are an



authorizer, then all the Process definitions created/modified by you are auto Approved and the Active status is set to “Yes”. Else, the Active status is set to “No” and can be authorized. Select the checkbox(s) adjacent to the required Process Code(s). Do one of the following:

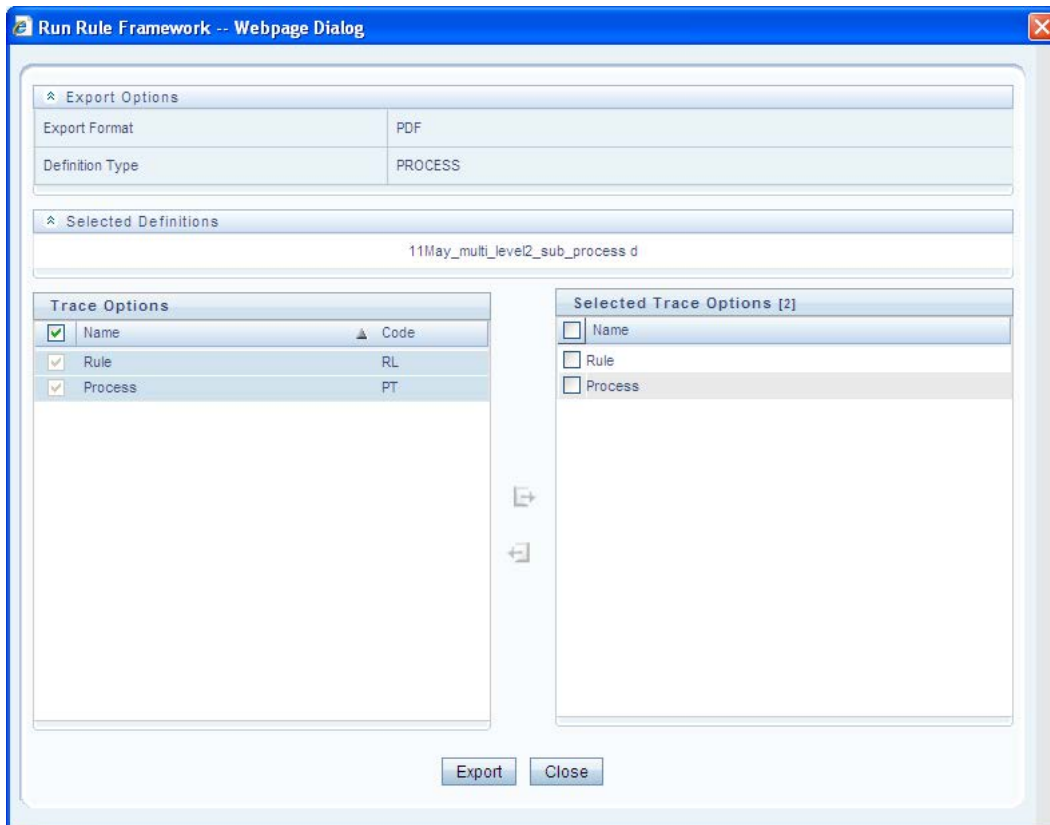
- To **Approve** the selected Process definitions, click  button.
- To **Reject** the selected Process definitions, click  button.

A Process is made available for use only after the approval. For a rejected definition a comment with the rejection details will be added.



## Export Process to PDF

You can export single/multiple Process definition details to a PDF file. To export the Process definition details in the *Process* screen:

1. Select the checkbox(s) adjacent to the required Process Codes.
2. Click  button in the *List* toolbar.
3. Click the  button in the popup. The *Export* dialog is displayed.



The *Export* dialog displays the Export Format, Definition Type, the names of the Selected Definitions, and the Trace Options. To select the Trace Options in the Trace Options grid:

- Select the checkbox(s) adjacent to the available options.
- Click  button. The selected options are displayed in the **Selected Trace Options** pane. You can also select a trace option and click  button to deselect it from the





Selected Trace Options pane.

4. Click **Export**. The process is initiated and is displayed in a pop-up specific to the current download. Once the pdf is generated, you can open / save the file from the *File Download* dialog.

You can either save the file on the local machine or view the file contents in a PDF viewer. The downloaded PDF displays all the details such as Linked to, Properties, Master info, Audit Trail, List, Mapping Details, and Comments of all the Process definitions selected.


## Trace Process Definition Details

You can trace the metadata details of individual Process definitions. To trace the underlying metadata details of a Process definition in the *Process* screen:

1. Select the checkbox adjacent to the Process Code whose details are to be traced.
2. Click  button from the List toolbar. The *Process Definition* screen is displayed with the details such as Traced Object (Name and Definition Type), other Processes and Runs in which the selected Process is used. In the *Trace Definition* screen you can also select individual Process or Run and click  button to view the definition details.

## Delete Process Definition

You can remove Process definition(s) which are no longer required in the system by deleting from *Process* screen.

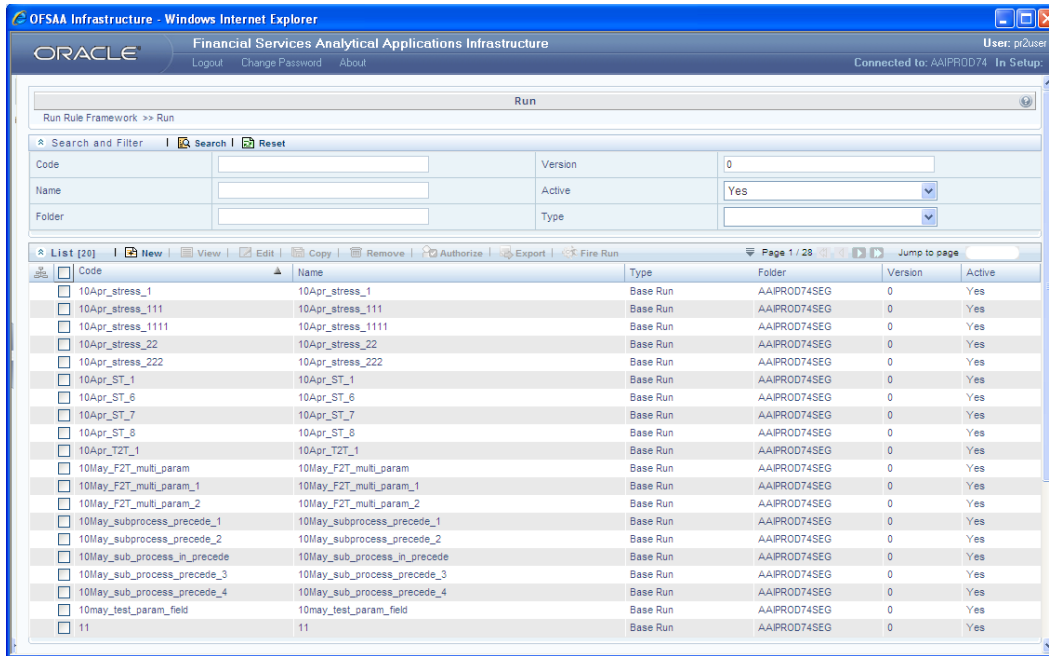
1. Select the checkbox(s) adjacent to the Process Code(s) whose details are to be removed.
2. Click  button from the List tool bar.
3. Click **OK** in the information dialog to confirm deletion. An information dialog is displayed confirming the deletion of the Process definition(s) and asking the authorization of the same.

### 2.4.3 Run

The Run option in the Rules framework helps you to combine various components and/or Processes together and execute them with different underlying approaches. Further, Run Conditions and/or Job Conditions can be specified while defining a Run.

Two types of Runs can be defined namely Base Run and Simulation Run.

- **Base Run** allows you to combine different Rules and Processes together as Jobs and apply Run Conditions and job Conditions.
- **Simulation Run** allows you to replace a Job with another Job (a Job can be a Rule or a Process), in addition to what a Base Run does.



The *Run* screen displays the runs created in the current Information Domain with the metadata details such as Code, Name, Type, Folder, Version, and Active status. You can archive/restore the existing PR2 definitions using the Metadata Restore/Archive utility and also migrate PR2/RRF definitions through the Command Line Utility across Information Domains / Setups.

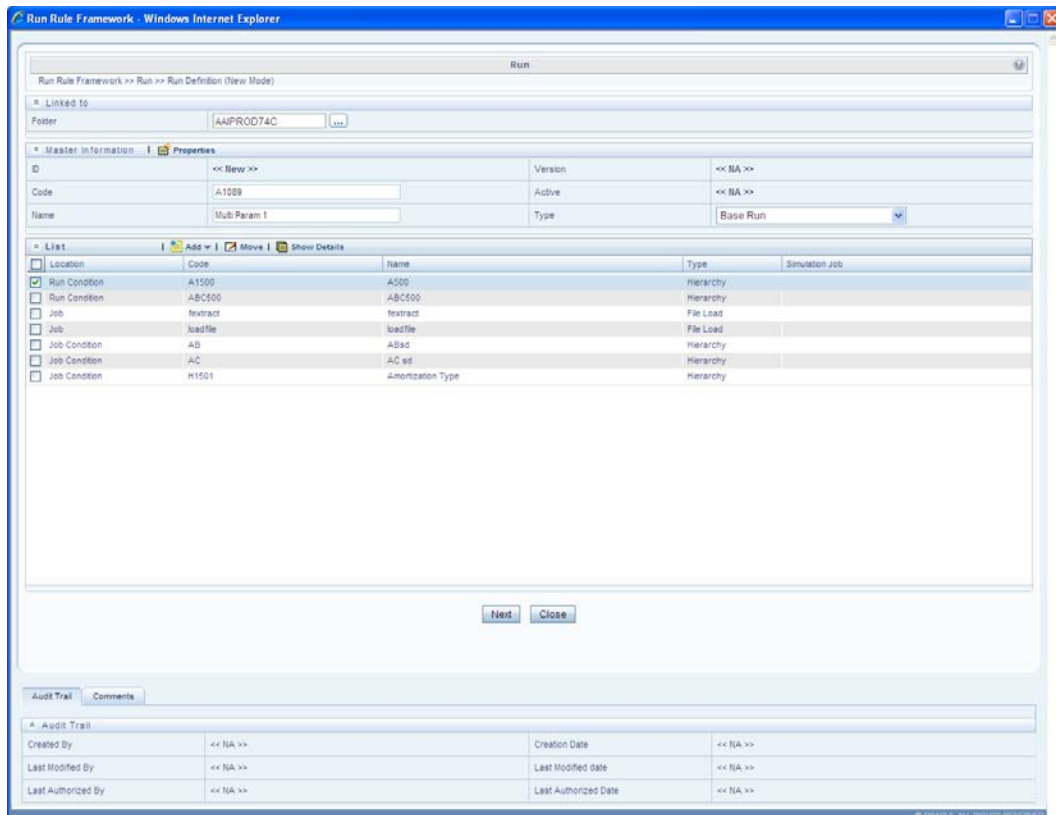
### Create Run


You can create Run definitions using the existing metadata objects. The various components that can be used to form Run definitions are mentioned in Process Hierarchy Members. The following filter conditions can also be applied to a Run definition:

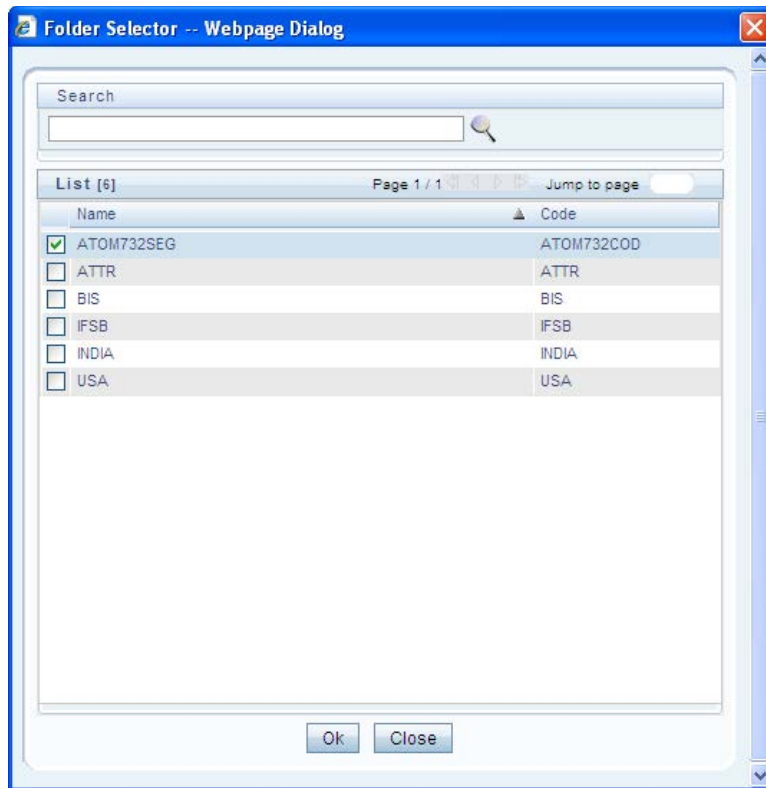
Condition Type	Description
Run Condition	When multiple components are selected, there is likelihood that the components may contain Rules / T2Ts whose target entities are across multiple datasets. When the selected components contain Rules, the target entities (hierarchies) which are common across the datasets are made available for defining Run Conditions. When the selected components contain T2Ts, the hierarchies that are based on the underlying destination tables which are common across the datasets are made available for defining the Run Condition. A Run Condition is defined as a filter on the available hierarchies.
Job Condition	A further level of filter can be applied at the component level. This is achieved through a mapping process.

To create a Run definition in the *Run* screen:

1. Click  button from the List toolbar. The *Run Definition (New Mode)* screen is displayed.



2. Click  button adjacent to the **Folder** field in the *Linked to* grid. The *Folder Selector* dialog is displayed.




3. Select the checkbox adjacent to the required folder. Click **OK**.

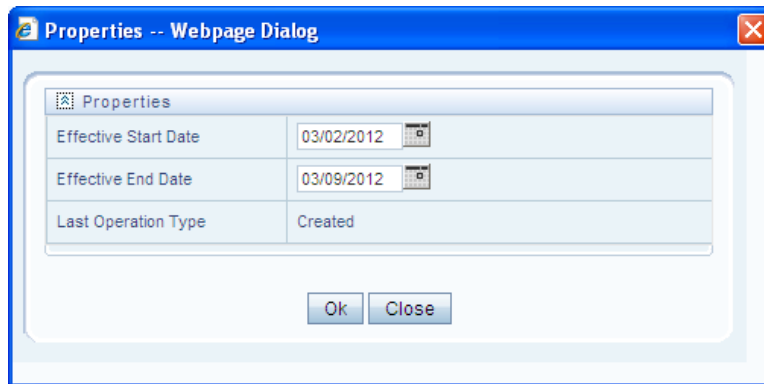
You can also enter a keyword and click  button in the **Search** field of *Folder Selector* dialog to locate a particular folder. The Pagination option helps you to manage the view of existing Folders within the system.

4. Enter the details of the *Master info* grid as tabulated below:



Field Name	Description
ID	Refers to the default ID of a newly created Run and is <<New >>
Code	Enter a valid code for the Run. Ensure that the code value specified is of maximum 30 characters in length and does not contain any special characters except “_”.
Name	Enter a valid name for the Run.
Version	By default the version field is displayed as <<NA>> for the new Run being created. Once the Run definition is saved, an appropriate version is assigned as either “-1” or “0” depending on the authorization permissions.
Active	By default, the Active field is displayed as <<NA>> for the new Run being created. Once the Run definition is saved, the status is set to “Yes” if you are an <i>Authorizer</i> creating the Run or “No” if the created Run needs to be Authorized by an <i>Authorizer</i> .

Field Name	Description
Type	Select the type of the Run from the dropdown box either as Base Run or as Simulation Run.

- Click  button in the *Master info* grid. The *Properties* dialog is displayed.





You can edit the below tabulated details in the *Properties* dialog:

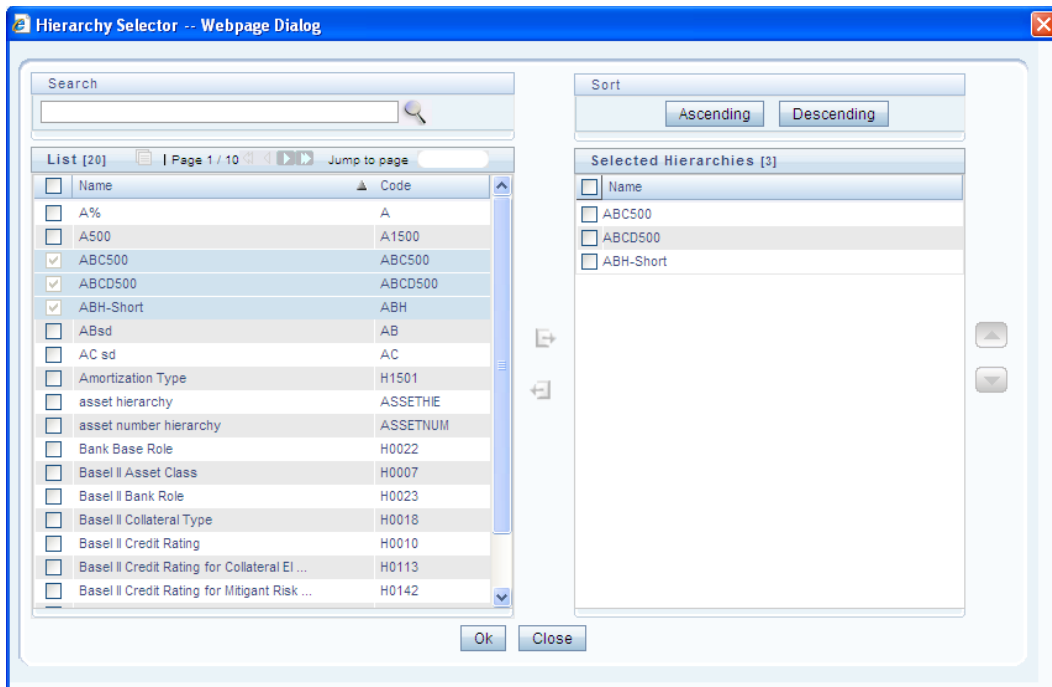
Field Name	Description
Effective Start Date	Select the Effective Start Date by clicking  (Calendar) button.
Effective End Date	Select the Effective Start Date by clicking  (Calendar) button.
Last operation Type	By default, this field displays the last change done to the Run definition. While creating a Run, the field displays the operation type as <b>Created</b> .

- Click **OK**. The properties are saved for the current Run definition.

### Select Run Condition for Run

You can select conditions to preset the initialization mechanism of a Run. To select a condition for a Run in the *Run Definition (New Mode)* screen:

- Click  button from the *List* grid and select Run Condition (). The *Hierarchy Selector* screen is displayed.



The LHS pane of the *Hierarchy Selector* screen displays the available members under the selected Folder.

1. Select the checkbox(s) adjacent to the members you want to select.
2. Click to move the selected members to the **Selected Hierarchies** pane.

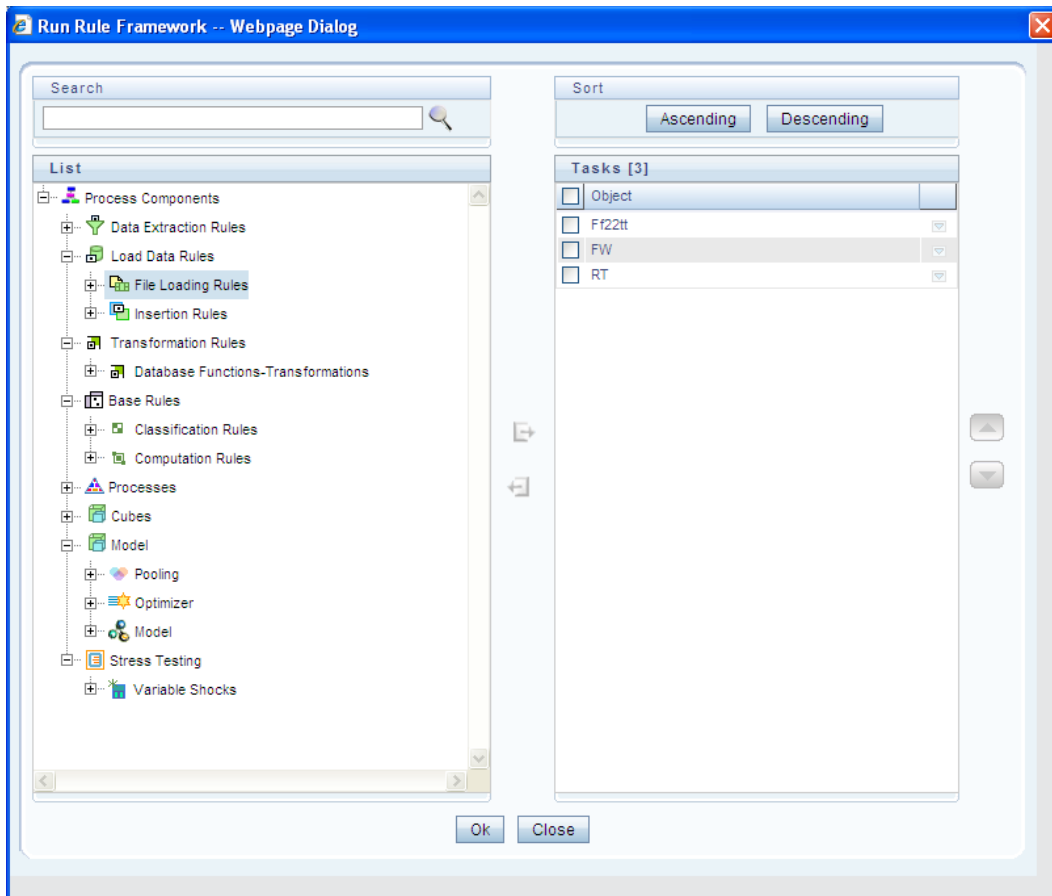
In *Hierarchy Selector* screen you can:

- Search for a member by specifying the nearest keyword and clicking button.
  - The Pagination option helps you to manage the view of existing Hierarchies within the system.
  - Click button to view the details of a selected member.
  - Click **Ascending** or **Descending** button re-arrange the selected list of members.
  - Click or button to move up or move down the selected members.
  - Click button to remove selected members from the Selected Hierarchies pane.
3. Click **OK**. The selected Hierarchies are listed in the *Run Definition (New Mode)* screen.

### Select Jobs for Run

You can select the required Jobs for the Run definition being created. To select Jobs for a Run in the *Run Definition (New Mode)* screen:

1. Click button from the *List* grid and select Job (). The *Job Selector* screen is displayed.



On the **List** pane of the *Job Selector* screen, you can click button to expand the members and view the job components. Select a Job Component and click to move the component to the *Tasks* pane.

---

**NOTE:** You cannot select same Jobs from both Aggregate data and Create Cube components, since those two definitions will have the same unique code.

---



In *Job Selector* screen you can also:

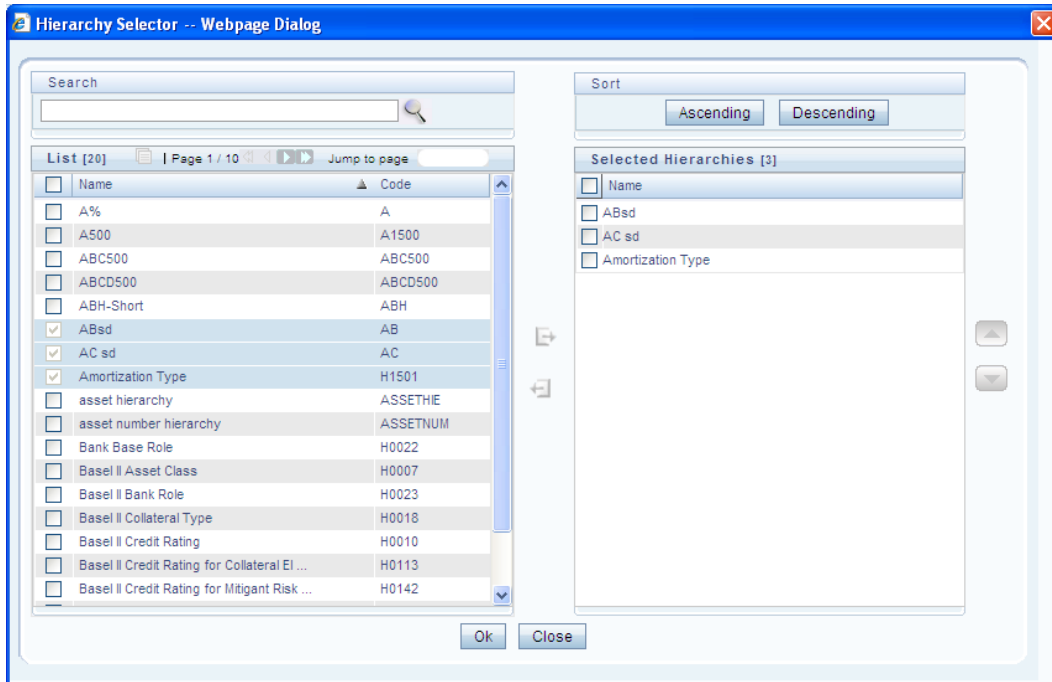
- Search for a component by specifying the nearest keyword and clicking button.
- Click Ascending or Descending button to sort the selected components in Ascending or Descending order.
- Click or button to move up or move down the selected components.
- Click button to add parameters for the selected components.
- Click button to remove selected components from the Tasks pane. Click **OK**. The components are listed under the selected Run.

### **Select Job Condition for Run**


You can select single Job Condition for the execution of pre defined Jobs in a Run. To select the Job

Condition for a Run in the *Run Definition (New Mode)* screen:






1. Click  button from the *List* grid and select Job Condition (). The *Hierarchy Selector* screen is displayed.



The LHS pane of the *Hierarchy Selector* screen displays the available hierarchies under the selected Folder.

2. Select the checkbox(s) adjacent to the Hierarchies that you want to select as Job condition.
3. Click  to move the selected hierarchies to the Selected Hierarchies pane.

In *Hierarchy Selector* screen you can also:

- Search for hierarchies by specifying the nearest keyword and clicking  button.
- The Pagination option helps you to manage the view of existing Hierarchies within the system.
- Click  button to view the details of a selected Hierarchy.
- Click **Ascending** or **Descending** button to sort the selected Hierarchies in Ascending or Descending order.
- Click  or  button to move up or move down the selected Hierarchies.
- Click  button to remove selected Hierarchies from the Selected Hierarchies pane.



---

**NOTE:** Ensure that you have selected only one Job Condition and the same hierarchy is not selected as both Run & Job conditions.

---

4. Click **OK**. The selected hierarchies are listed in the *Run Definition (New Mode)* screen. In the *List* grid you can also:




- Click  button to move a selected member between Run Condition and Job Condition.
- Click  button to view the selected member details.

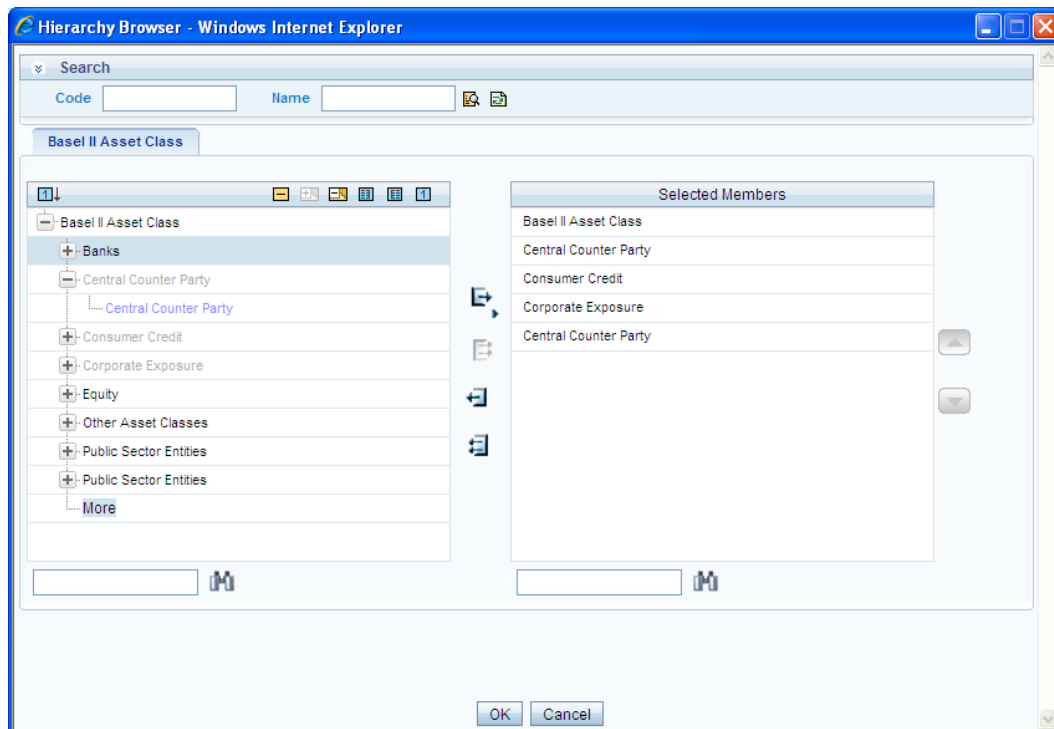
Once all the necessary information in the first screen of the *Run Definition (New Mode)* is populated, click **Next** button to navigate to the concurrent procedures of defining a Rule.





The second screen of *Run Definition (New Mode)* screen displays all the information you have provided in the *Linked to* and *Master info* grids. You can view the filters you have selected in the *Run Condition* grid.



### Hierarchical Member Selection







In the *Run Condition* grid, you can modify the Run Conditions you have defined in the first screen of the Run Definition by including hierarchical members. To modify the condition of a Run Condition in the *Run Condition* grid:








1. Click  button adjacent to the Run Condition details. The *Hierarchy Browser* screen is displayed.




The *Search* grid allows you to search for a particular member by entering Code or any part of the Name and clicking  button. You can click  button to refresh the Code or name fields. You can also find a member in the grid using  button. Click  and expand the members of the selected hierarchy.

Select a member / node and click  to select the same. Click the  to select the member as Self, Self & Descendants, Self & Children, Parent, Siblings, Children, Descendants, or Last Descendants. In the *Hierarchy Browser* screen you can also:

- Click  or  to sort the members by Code or Name.
- Click  or  to expand or collapse the members under a node.
- Click  or  to expand a branch or collapse a branch.

- Click  or  to view the code values of members right or left.
  - Click  or  to show code or show name of the members.
  - Click  or  to move the members up or down in the Selected Members pane.
2. Click  button adjacent to a filter details to launch it. The *Preview SQL Query* screen is displayed with the resultant SQL equivalent of the launch result.


The *Detail Information* grid displays the Jobs and Job Condition defined in the primary page of the *Run Definition (New Mode)* screen.


- Click  button adjacent to the Job Names to reorder the selected Jobs.
- Select the checkbox in the selected Hierarchy member column to apply the Job condition.
- Click a Job to view the details in the *Show Details* screen.

You can click **Back** button to navigate back to the first page of the *Run Definition (New Mode)* screen to modify any details.

Once all the necessary details are entered, Click **Save**. The Run definition is saved with the provided details and is displayed in the *Run* screen. The default version of a new Run definition is “0” and the default version of an unauthorized definition is “-1”.

The *Audit Trail* section at the bottom of *Run Definition (New Mode)* screen displays metadata information about the Run definition created. The *User Comments* section facilitates you to add or update additional information as comments.


You can view individual Run definition details at any given point. To view the existing Run definition details in the *Run* screen, select the checkbox adjacent to the Run Code whose details are to be viewed. Click  button in the List tool bar. The *Run Definition (View Mode)* screen is displayed with all the details of the selected Run. Click **Next** and **Back** buttons to navigate back and forth in the *Run Definition (View Mode)* screen.

You can modify all the details except ID, Code, Version, Active status, and Type of a Run definition. To modify an existing Run definition in the *Run* screen, select the checkbox adjacent to the Run Code whose details are to be updated. Click  button in the *List* tool bar. Edit button is disabled if you have selected multiple Runs.

### **Run Definition Versioning**

The default version of a new Run definition created by an Authorizer is "0" and the one created by non Authorizer is "-1". When you edit and save a Run, you are prompted either to overwrite the already existing details or save the same as latest version (version "0") or to create a subsequent version wherein the existing details are retained as of current version +1. A definition with version "-1", when edited by an authorized user changes to "0" and an unauthorized user remains as "-1".

### **Copy Run Definition**

The Copy Run Definition facilitates you to quickly create a new Run Definition based on an existing Run or by updating the values of the required Run. To copy an existing Run Definition in the *Run* screen, Select the checkbox adjacent to the Run Code whose details are to be duplicated. Click  button in the List toolbar to copy a selected Run definition. The *Run Definition (Copy Mode)* screen is displayed. Copy button is disabled if you have selected multiple Runs. In the *Run Definition (Copy Mode)* screen you can:

- Create new Run definition with existing variables. Specify a new **Run Code** and **Folder**. Click **Save**.



- Create new Run definition by updating the required variables. Specify a new **Run Code**, **Folder**, and update other required details. Click **Save**.

The new Run definition details are displayed in the *Run* screen. By default, version “0” is set if you have authorization rights, else the version is set to “-1”.

### Authorize Run Definition

All the actions in a Run definition should be approved by an authorizer. An authorizer can Approve a pre-defined Run definition for further execution or Reject an inappropriate Run definition listed within the *Run* screen. If you have Authorizer function mapped to your role, the Run definition is auto Approved as you save it and the Active status is set to “**Yes**”. Otherwise the Active status is “**No**” and can be authorized.



To Approve/Reject Runs in the *Run* screen, select the checkbox(s) adjacent to the required Run Codes. Do one of the following:

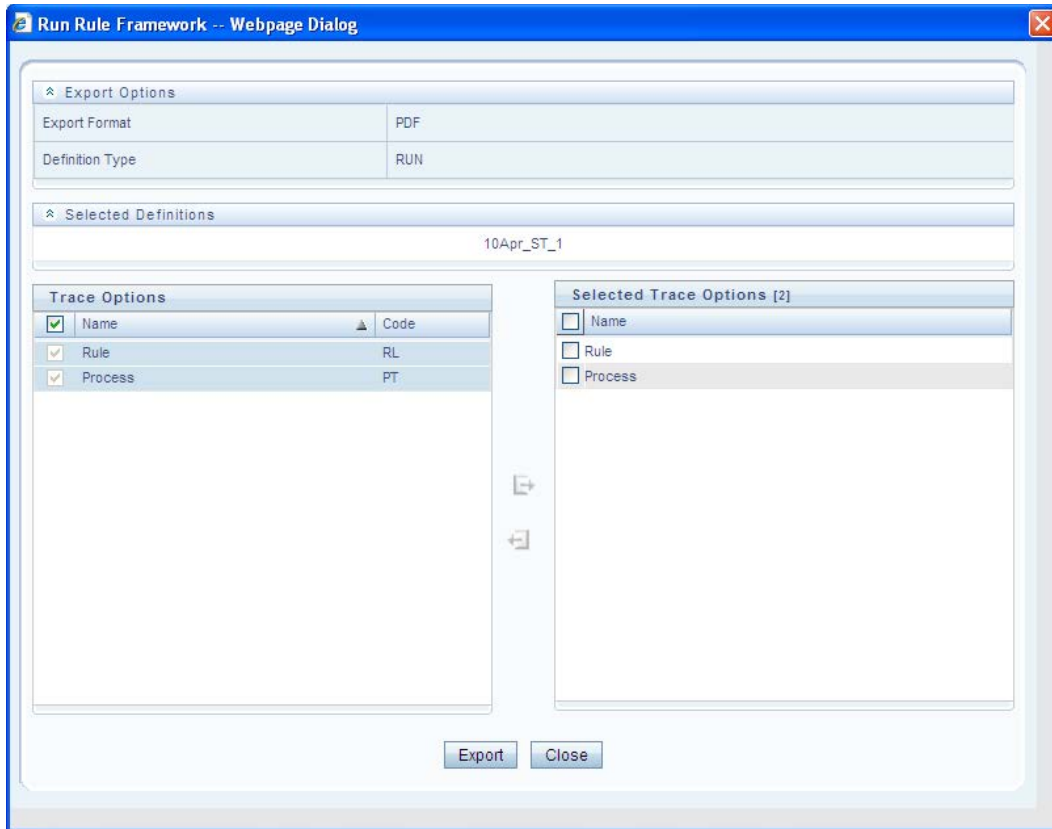
- To Approve the selected Run definitions, click  button.
- To Reject the selected Run definitions, click  button.

A Run is made available for use only after the approval. For a rejected definition a comment with the rejection details will be added.



### Export Run to PDF

You can export multiple Run definition details to a PDF file. To export the Run definition details in the *Run* screen:

1. Select the checkbox(s) adjacent to the required Run Codes.
2. Click  button in the List toolbar.
3. Click the  button in the popup. The *Export* dialog is displayed.




The *Export* dialog displays the Export Format, Definition Type, the names of the Selected Definitions, and the Trace Options. To select the Trace Options in the *Trace Options* grid:

- Select the checkbox(s) adjacent to the available options.
- Click  button. The selected options are displayed in the Selected Trace Options pane. You can also select a trace option and click  button to deselect it from the Selected Trace Options pane.


Click **Export**. The process is initiated and is displayed in a pop-up specific to the current download. Once the pdf is generated, you can open / save the file from the *File Download* dialog. You can either save the file on the local machine or view the file contents in a PDF viewer. The downloaded PDF displays all the details such as Linked to, Properties, Master info, Audit Trail, List, and Comments of all the Run definitions selected.

## Fire Run

The Fire Run feature in the *Run* screen facilitates you to execute a previously created Run. To execute a Run:


1. Select the checkbox adjacent to the Run Code which you want to execute.
2. Click  button in the List toolbar.
3. The *Fire Run* screen is displayed.

4. In the *Fire Run* screen, enter the field details as tabulated below:

Field Name	Description
Name	By default, this field displays the name of the selected Run.
Request Type	Select the request type either as <b>Single</b> or as <b>Multiple</b> from the drop down box. <i>Note: A <b>Single</b> request creates a Batch where as a <b>Multiple</b> request creates Batch group.</i>
Batch	Select the Batch either as Create or as Create & Execute.
MIS Date	Click  button and the Calendar is displayed. You can select the MIS Date from the calendar. This field is displayed only if you have selected Request Type as <b>Multiple</b> with any of the Batch mode or Request Type as <b>Single</b> with Batch mode as <b>Create &amp; Execute</b> .
Wait	Select the Wait value either as <b>Yes</b> or as <b>No</b> . <ul style="list-style-type: none"> <li>Select <b>Yes</b> to provide the Duration in seconds after which the Fire Run status should be displayed.</li> <li>Select <b>No</b> to display the Fire Run status immediately.</li> </ul>
Duration	Enter the duration in seconds after which the Fire Run status should be displayed. <i>Note: This field is displayed only if you have selected the Wait value as <b>Yes</b>.</i>

Field Name	Description
Parameters	Enter the required parameters in the field provided. The parameter provided in this field is considered for Run execution.
Filters	Enter the filter details in the field provided. The filters provided in this field are considered for Run execution.

5. Click **OK**. The details are saved and the Run is executed as per the Fire Run details.

You can remove Run definition(s) which are no longer required in the system by deleting from *Run* screen, selecting the Run Codes whose details are to be removed and clicking the  icon.

## 2.5 System Configuration

System Administrators define the Servers, Database, and Information Domain along with the other Configuration processes such as segment and metadata mapping, hierarchy security, and designing the Infrastructure Menu functions. System Configuration is mostly a onetime activity which helps System administrator to make the Infrastructure system operational for usage. System Configuration activities should be performed by the infrastructure administrator using the admin credentials. To access System Configuration, you must be mapped to SYSADM function role within the Infrastructure system.





### 2.5.1 Segment/Metadata Mapping

Segment refers to a logically divided part of the whole object based on specific requirement. Segment/Metadata Mapping in the System Configuration section facilitates you to map/unmap the required business metadata definitions such as measures, hierarchies, cubes, and attributes to the selected segment within a specific Information Domain. Based on the mapping, users mapped to the segment are restricted to access only the relevant metadata to view and edit during metadata maintenance and information security.

You (System Administrator) need to have SYSADM function role mapped to your role to access Segment/Metadata Mapping section. You can access *Segment/Metadata Mapping* in LHS menu of System Configuration. By default the *Metadata Segment Mapping* screen displays the Information Domain Name to which you are connected along with the metadata details of Measure.

## Map Metadata Definitions

You can map/unmap the required business metadata definitions to a segment available within the selected Information Domain. To map the required metadata definitions, do the following:

1. Select the required User Segment from the drop-down list.
2. Select the required metadata definition as Measure, Hierarchy, Cube, or Attribute. The defined metadata are listed in the Available Metadata pane.
3. Map/Unmap the required metadata by doing the following:
  - To map a metadata, select the metadata from the *Available Metadata* list and click  button. The metadata is added to the *Selected Metadata* pane. You can press **Ctrl** key for multiple selections.
  - To map all the listed metadata definitions, click  button.
  - To remove a metadata mapping, select the metadata from the Selected Metadata list and click  button.
  - To remove the entire metadata mapping, click  button.
4. Click **Save** to save the metadata mapping details. The screen is refreshed displaying the mapping results.

5. Click **Show Details** to view the results in detail.

You can modify the mapping at any point and the mapping table is updated only on saving the mapping details. When a metadata definition such as measures, hierarchies, cubes, and attributes are removed from the Information Domain, the same is updated in the mappings table.

## 2.6 Administration

Administration facilitates system administrators to define the security framework with the capacity to restrict access to the data and metadata in the warehouse, based on a flexible, fine-grained access control mechanism. The document deals with Saving Metadata activity of the system administrator. For more information on the Administration related activities, refer to the OFS Basel Regulatory Admin Guide.

You (System Administrator/System Authorizer) need to have SYSATH, SYSADM, and METAAUTH function roles mapped to access the Administration framework within the Infrastructure system. Administration is available within the tree structure of left hand side (LHS) menu in the Infrastructure home page. Click + to expand and view the Administration sections in detail.





### 2.6.1 Save metadata

Save Metadata within the Infrastructure system facilitates you to resave the changes done to an authorized metadata for the selected Information Domain. When you resave metadata, all the existing metadata definitions are updated with the current changes along with the current modified date.

The screenshot displays the 'Metadata Resave' interface. At the top, the title bar reads 'Metadata Resave'. Below it, the 'Metadata Details' section is expanded, showing the 'Information Domain' as 'BASELINF2'. Three radio buttons are present: 'Hierarchy' (selected), 'Derived Entity', and 'Map'. The main area is divided into two panes: 'Available Metadata' on the left and 'Selected Metadata' on the right. The 'Available Metadata' list contains 20 items, including 'Hedge In effective Pair', '100 pct RW for Corporates', 'AFC Indicator', 'Actual Business Days', 'Attribution Analysis Rule Change Indicator - Advance Appro', 'Attribution Analysis Rule Change Indicator - Simple Approac', 'Attribution to multiplication factor', 'Automatic Cancellable Facility', 'BCB - Backed by Mortgage', 'BCB - Financial Statement Disclosure Indicator', 'BCB - LTV Ratio', 'BCB - Non Sec OTC Indicator', 'BCB - Residual Maturity Band', 'BCB - Underlying Type', 'Balance Phase In Capital Component Group', 'Bank Base Role', 'Bank Cap Consl Approach', 'Bank Collateral Type', 'Bank Equity Issuer Type', and 'Bank Holds Debt of the Company'. The 'Selected Metadata' pane is currently empty. At the bottom of the interface, there are 'Save' and 'Reset' buttons.

You (System Administrator) need to have SYSADM function role mapped to access the Metadata Authorization within the Administration framework of the Infrastructure system. The Metadata Resave screen displays the list of Available Metadata for Hierarchy (default) for the selected Information Domain. To resave metadata in the Metadata Resave screen:



1. Filter the metadata type by selecting Hierarchy, Derived Entity, or Map. The list of Available Metadata is populated. Do one of the following:
  - Select the required metadata from the Available Metadata list and click  button. You can press Ctrl key for multiple selection.
  - To select all the Available Metadata, click  button.
  - You can also deselect a metadata by selecting from the Selected Metadata list and clicking  icon or deselect all the selected metadata by clicking  button.
2. Click **Save** and update the metadata changes.

Once the details are updated, you can click **Show Details** to view the status. You can also click **Reset** to clear the selection.

## 2.6.2 Utilities

Utilities refer to a set of additional tools which helps you to fine tune a defined process or maximize and ensure the security of a database based on your need. The Utilities within the Administration framework of Infrastructure system facilitates you to maintain the data in the Oracle database using the various administrative tools. You can define the user access permissions, batch securities, upload attributes, find metadata difference, and migrate source objects to target database.

You (System Administrator) need to have SYSADM function role mapped to access the Utilities section within the Infrastructure system. You can access Utilities section within the Administration framework under the tree structure of LHS menu.

### UserGroup -Batch Execution Map

UserGroup-Batch Execution Map facilitates you to map the required UserGroup to the defined Batch(s) before you execute them from Batch Execution or Batch Scheduler screen. You can map multiple user groups of an Information Domain to different batches. If a user is mapped to multiple UserGroups, the combined list of batches mapped to these user groups is available in the Batch Execution or Batch Scheduler screen for execution.

The default UserGroup of a user who has created the batch has the maximum Precedence Value among the other UserGroups and is automatically mapped for execution. An explicit mapping of this UserGroup to the Batch is not required.

You (System Administrator) need to have SYSADM function role mapped to access the UserGroup-Batch Execution Map within the Utilities section of the Infrastructure system. The UserGroup-Batch Execution Map screen displays the list of defined Batches for the selected Information Domain along with the other details such as Batch Name and Batch Description. You can filter the list of defined batches which are created in Batch Maintenance, Advanced Analytics Infrastructure, or in Rules Framework. By default the list displays the batches defined in the Batch Maintenance screen. To Map UserGroup to the required Batch in the *UserGroup-Batch Execution Map* screen:

1. Select the Information Domain from the drop down list. By default, the screen displays the Information Domain to which you are connected.
2. Select the Groups from the drop down list. The list consists of all the User Groups mapped to the selected Information Domain. The screen is refreshed and the list of defined batches is populated.
3. You can also search for a specific user group by clicking Search and specifying the User Group Name in the User Maintenance-Search screen. Click OK.

4. Select the checkbox adjacent to Batch Maintenance (default), Advanced Analytics Infrastructure, or Rules Framework and filter the list of batches. You can also select ALL to list all the defined batches for the selected Information Domain.
5. Map UserGroup to Batch(s) by doing the following:
  - To map batch(s) to the selected UserGroup, select Batch Map checkbox.
  - To map all the batches to the selected UserGroup, click Check All.
  - You can also click Uncheck All to remove all the mapping.
6. Click Save to save the UserGroup-Batch mapping details.

## 2.7. Data Quality Framework

Data quality refers to finding out expected or known anomalies in data provided. This application allows you to define 8 different criteria as per business requirement. Thus, one can define more than one criterion for a column. This helps in performing rigorous quality checks on the data. The application provides the query right at the time of the definition so that you can ensure that the application notifies data elements as per requirement.

You can define the severity of the check which reflects the criticality of check. The options available are 'Error', 'Warning' or 'Information'. When you define these checks, approval is mandatory before the checks are executed. For more information on Data Quality Checks, refer to the *OFS Analytical Applications Infrastructure User Guide*.

**NOTE:** Assignment type has code and leaf members that are created/populated using AMHM screen, which is a part of EPM products.

## 2.8. Stress Testing Framework

Stress Testing or risk estimation technique refers to the process of examining the stability of a system or entity in adverse conditions. It involves testing beyond normal operational capacity, often to a breaking point, in order to observe the results. Stress testing is now an integral part of a bank's risk measurement system and plays an important role in estimating the effects of potential financial crises on a bank's operations. Stress Testing also facilitates banks to conduct analysis to estimate the impact of movements in the variables on specific measures such as profitability and capital adequacy.

Stress Testing within the infrastructure system is an integrated framework which supports the stress testing requirements across the entire suite of OFSAAI products. It allows banks to define shocks and assess the impact of such shocks across multiple business areas. For more information on the Stress Testing Framework, refer to the *OFS Analytical Applications Infrastructure User Guide*.

## Chapter 3 Basel Regulatory Capital Basic Application

### 3.1 Scope of the Application

The Oracle Financial Services (OFS) Basel Regulatory Capital application is categorized into two versions: OFS Basel Regulatory Capital Basic and OFS Basel Regulatory Capital Internal Rating Based Approach. OFS Basel Regulatory Capital Basic supports the Standardized approach and its variants for the BIS Jurisdiction, Standardized approach for the Indian, Islamic Banking, Brazilian, and CBRC Jurisdictions. OFS Basel Regulatory Capital Internal Ratings Based Approach is based on the approaches supported by the OFS Basel Regulatory Capital Basic Application as well as the Advanced approaches for BIS, USA, and CBRC Jurisdictions.

The versions of the guidelines supported by the Oracle Financial Services Basel Regulatory Capital Basic application, Release 6.0.0.0.0 are as follows:

- **BIS Jurisdiction:** For the BIS jurisdiction, the following approaches for Risk Weighted Assets (RWA) and Capital Adequacy Ratio computations are supported:

#### Basel I

Credit Risk

- Non Securitization – Standardized Approach

Capital Structure

#### Basel II and Basel III

Capital Structure

Credit Risk

- Non Securitization – Standardized Approach
- Securitization - Standardized Approach

Market Risk

- Market Risk – Standardized Approach
- Market Risk – Internal Model Method (IMM) Approach

Operational Risk

- Operational Risk – Basic Indicator Approach
- Operational Risk – Standardized Approach
- Operational Risk – Alternate Standardized Approach

- **Indian Jurisdiction:** In the Indian jurisdiction, the following approaches for RWA and Capital Adequacy Ratio computation are supported:

Credit Risk

- Non Securitization – Standardized Approach
- Securitization - Standardized Approach

Market Risk

- Market Risk – Standardized Approach

Operations Risk

- Operational Risk – Basic Indicator approach

#### Capital Structure

- **Islamic Banking:** In the jurisdiction of Islamic Banking the following approaches for RWA and Capital Adequacy Ratio computation are supported:

#### Credit Risk

- Non Securitization – Standardized Approach
- Securitization - Standardized Approach

#### Market Risk

- Market Risk – Standardized Approach

#### Operational Risk

- Operational Risk – Basic Indicator approach

#### Capital Structure

- Supervisory Discretionary Formula
- **Brazilian Jurisdiction:** In the jurisdiction of Brazil the following approaches for RWA and Capital Adequacy Ratio computation are supported:

#### Credit Risk

- Non Securitization – Standardized Approach

#### Market Risk

- Market Risk – Standardized Approach

#### Operational Risk

- Operational Risk – Basic Indicator approach
- Operational Risk – Alternative Standardized Approach
- Operational Risk – Simplified Alternative Standardized Approach

#### Capital Structure

- **CBRC Jurisdiction:** In the jurisdiction of CBRC the following approaches for RWA and Capital Adequacy Ratio computation are supported:

#### Market Risk

- Market Risk – Standardized Approach

#### Operational Risk

- Operational Risk – Standardized Approach

#### Capital Structure

The versions of the guidelines supported by the Oracle Financial Services Basel Regulatory Basic application, Release 6.0 are as follows:

- 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)

- India Jurisdiction: RBI-Final Guidelines of April 2007 and Amendments to Final Guidelines issued in March 2008.
- Islamic Banking Jurisdiction: IFSB: Capital Adequacy Framework issued in December 2005 and January 2009.
- Brazilian Jurisdiction: Circulars issued by Banco Central Do Brasil which are as follows:
  - CIRCULAR 3.360: Credit Risk issued in December 2007
  - CIRCULAR 3.383: Operational Risk issued in April 2008
  - CIRCULAR 3.361, 3.362, 3.363, 3.364, 3.366, 3.368 and 3.3369: Market Risk issued in September 2007
  - CMN Resolutions 3.490: Capital Requirement issued in August 2007.
  - CBRC Jurisdiction: Supervisory guidelines on Capital Adequacy Ratio of Commercial Banks issued by the China Banking Regulatory Commission (CBRC) for Basel II adoption in Chinese Banks on 1st October 2008.

In the OFS Basel Regulatory Capital Release 6.0.0.0.0, rules relating to 'Basel III: A global regulatory framework for more resilient banks and banking systems, Dec 2010 (rev Jun 2011)' have been introduced. The following enhancements have been introduced in this Release for the BIS jurisdiction:

- Capital Buffer: As introduced in the Basel III Accord, the application calculates the following 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 Risk weighted assets during periods of high credit growth. Loss absorbency is also required to be met as an extension of Capital Conservation Buffer. The application supports the calculation of additional capital surcharge requirements in the case of Global systemically important banks (G-SIBs).
- Leverage Ratio: The application calculates the Leverage Ratio for a Reporting Bank. The application supports calculation of Capital measure and Exposure measure that are used in the calculation of Leverage Ratio.
- CVA Risk: The application supports the calculation of CVA Risk Capital charge (as introduced in the Basel III accord) in addition to counterparty default risk charge for Over the Counter derivative portfolio.

## 3.2 Attribution Analysis

Attribution Analysis functionality is introduced in the application as a method to analyze the impact of various attribution variables, on the change in Risk Weighted Assets (RWA). It analyzes the capital ratio of the bank across two runs, which are a quarter apart or even a year apart. This functionality enables you to understand the cause of an RWA increase or capital ratio decrease. This become possible by providing them with a causal analysis of various control factors in attribution classes such as Credit Risk, Market Risk, Operational Risk, and Capital Structure categories.

Attribution variables are clubbed together under Attribution categories which are further under the attribution classes. But you can include other categories, depending on the attributes you need to analyze. Thus you can select or deselect the relevant categories for the analysis. In short, Attribution Analysis feature is flexible and enables you to customize the categories and variables to suit your portfolios for analysis.

### 3.2.1 Credit RWA

This functionality is useful for the risk analysts in a scenario, where your RWA has increased and capital ratio has decreased, as compared to the previous quarter when the business growth has been static. The Basel

application performs necessary analyzations to find the root cause behind the Credit RWA attribution changes, based on various contributing factors.

## Non Securitized Attribution Categories under Credit RWA

The attribution categories that contribute to the attribution analysis for Non-Securitization are the following:

- **Rating Migration:** Rating migration (downgrade or upgrade) leads to a direct impact on the risk weights applied to the credit risk exposures.
- **Exchange Rate Fluctuations:** Change in exchange rate of the reporting currency with respect to the major currencies in the bank's portfolio impacts all the inflows and outflows.
- **Effective Maturity:** Effective maturity impacts the EAD calculation for advanced approaches. Change in effective maturity leads to a change in RWA for the credit exposures of the advanced approaches.
- **Provisioning:** Change in the provisioning amount leads to a change in the exposure amount, which is at risk. This further leads to a change in RWA. Any change in loss provisioning amount can also be attributed to the change in corresponding RWA.
- **Past Due Analysis:** Change in the number of exposures and the amount of past due exposures impacts the risk weights. The handling of the same leads to a change in RWA for Credit Risk. Between the two runs, if the status of the exposures changes from current to past due or vice versa, the RWA's for those exposures and the difference of the two sets of RWAs can be computed.
- **Net Business Growth:** Change in number and amount of exposures indicate the net business growth of the bank. The change in RWA due to this factor can be attributed to business growth. The application determines the new exposures and the exposures that have been closed by comparing the list of the two runs. The difference in the RWA's provide the impact on RWA's of the Net Business Growth.
- **Collateral Valuation:** Keeping the mark-to-market value of a collateral against an exposure change leads to a change in the post mitigation RWA of that exposure. Thus, this impacts the overall Credit RWA and capital ratio. The application monitors the mark-to-market values of the collaterals that are kept to mitigate the risk arising out of the exposure. The change in such values are used to identify the change in the RWA across two runs and attribute that difference to these amounts.
- **Probability of Default:** Any change in the macroeconomic variables impacts the probability of default percentages of the customers. This in turn leads to the change in RWA. Since directly monitoring the changes in the macroeconomic variables like GDP is not possible, the application monitors the changes in the parameters such as PD that are impacted by them. The change in the PD value of a customer across two runs can contribute to the RWA change for the portfolio.
- **Loss Given Default:** Any change in the macroeconomic variables impacts the LGD percentages of the exposures. This leads to the change in RWA. Since it is difficult to directly monitor the changes in the macroeconomic variables like GDP, the application monitors the changes in the parameters such as LGD that are impacted by them. The change in the LGD value of an exposure across two runs can contribute to the RWA change for the portfolio.
- **Write-Offs:** Number of exposures written off in the latest run as compared with those in the previous run provides an insight into the impact on RWA due to write-offs. This help in attributing the RWA change accordingly.
- **Exposure Amount:** Comparing the exposure amounts of an exposure across the two runs helps in getting an insight into the impact on RWA due to the exposure amount changes.
- **Others:** This captures the changes in RWA across two runs which could not be attributed to any of the preceding reasons. Computation for this depends on the variables selected while defining an attribution analysis.

## Securitized Attribution Categories under Credit RWA

The attribution categories that contribute to the attribution analysis for Securitization are the following:

- **Due Diligence Requirement:** Any change in the due diligence requirement impacts the exposure amount and the RWA of those credit exposures where Basel methodology opted for the run is gross up approach and hence help us to attribute the RWA changes accordingly.
- **Rating Migration:** Rating migration (downgrade or upgrade) leads to a direct impact on the risk weights applied to the credit risk exposures.
- **Net Business Growth:** Change in the number of exposures and amount indicates the net business growth of the bank. The change in RWA due to this factor can be attributed to business growth.
- **Exchange Rate Fluctuations:** Change in the exchange rate of reporting currency with respect to the major currencies in the bank's portfolio impacts all the inflows and outflows which have the natural currency as the one for which the exchange rate has been impacted.
- **SSFA Parameter Impact:** Tracking the changes in the RWA as a result of change in the risk weight across two runs where there is no change in the due diligence requirement and bank opts SSFA methodology.

### **3.2.2 Capital Structure Attribution Categories**

The following are the attribution categories for Capital Structure:

- **Common Equity Tier 1 Capital:** Changes in the CET1 amounts leads to a change in capital ratios. The changes can be monitored from the following attribution variables and the change in capital ratio can be attributed to the same:
  - Paid up equity capital
  - Share premium
  - Undisclosed Reserves
  - Retained Earnings
  - Accumulated Other Comprehensive Income
  - Minority Interest
  - Regulatory Adjustments for CET1
- **Additional Tier 1 Capital:** Changes in the AT1 amounts lead to a change in capital ratios. The changes can be monitored in the following attribution variables and the change in capital ratio can be attributed to the same:
  - Instruments eligible for AT1
  - Share Premium from Instruments Eligible for AT1
  - Minority Interest for AT1
  - Regulatory Adjustments for AT1
- **Tier 2 Capital:** Changes in the Tier 2 amounts lead to a change in capital ratios. The changes can be monitored in the following attribution variables and the change in capital ratio can be attributed to the same:
  - Instruments Eligible for T2
  - Share Premium from Instruments Eligible for T2
  - Minority Interest for T2

- Loan Provisions
- Regulatory Adjustments for T2
- Transition: Due to the phase-in and phase-out timelines for Basel III implementation, capital compositions and deductions may change. This may lead to a difference in the capital ratios. The application identifies the changes in capital compositions and the deductions introduced due to the transition phases and attributes the capital ratio changes to the same accordingly.
- Others: This captures the change in Total Capital Ratio across two runs which could not be attributed to any of the preceding reasons. Computation for this depends on the variables selected while defining an attribution analysis.

### **3.2.3 Market RWA**

Attribution analysis for changes in Market RWA is computed for certain control variables, which are essentially the different approaches used for arriving at the RWA. Computation on each control variable is further divided based on the risk types. This section explains such various attribution variables and recognizes the changes in RWA corresponding to these variables. This functionality in the application enables you to understand how the RWA does has increased and capital has declined as compared to the previous quarter even when the business growth is static.

The market risk attribution variables are detailed here:

- Exchange Rate Fluctuations: Change in exchange rate of the reporting currency with respect to the major currencies in the bank's portfolio impacts all the inflows and outflows.
- Net Business Growth: Change in number and amount of exposures indicate the net business growth of the bank. The change in RWA due to this factor can be attributed to business growth. The application determines the new exposures and the exposures that have been closed by comparing the list of the two runs. The difference in the RWA's provide the impact on RWA's of the Net Business Growth.
- Rating Migration: The migration of ratings impact the market risk exposures as it increases the specific risk capital charge that is applied to interest rate securities. Rating migration impact can be seen on the IR exposures where the specific risk charge is applied based on the counterparty ratings. According to the jurisdictions, whichever exposure category considers ratings, the exposure amount of those exposures impacts market RWA. Ratings of the various counterparties can be tracked and the change in exposure amounts with the change in ratings are provided as an end result.
- Carrying Value: The change in carrying value of the positions (market value) is responsible for the movement in exposure value without any new business growth accounted for. This impacts RWA. The application monitor the market value changes (carrying value) excluding the exposures or positions added in the new run. Thus this change and the corresponding change in RWA becomes an attribute for analysis.
- Bond Rates: The change in the interest rates of the bonds are monitored by the application. This is useful in analyzing the impact of an interest rate movement on RWA due to market risk.
- Greek Impact: The change in the Gamma and Vega impact for the exposures leads to a change in General Risk Charge, hence change in the RWA computed for market risk.
- Others: This captures the change in Total Capital Ratio across two runs which could not be attributed to any of the preceding reasons. Computation for this depends on the variables selected while defining an attribution analysis.

### **3.2.4 Operational RWA**

This section details about various attribution variables and recognizes the changes in RWA corresponding to these variables. It also explains about attributing such changes in RWA and capital ratio to the



appropriate Attribution Variable. This functionality of the application enables you to understand why the RWA has increased and capital has decreased as compared to the previous quarter when the business growth was static. This feature identifies the root cause of RWA changes by analyzing various contributing factors.

Attribution analysis for changes in Operational RWA is computed for the following control variables, which are the different approaches used for arriving at the RWA:

- Exchange Rate Fluctuations: Change in exchange rate of the reporting currency with respect to the major currencies in the bank's portfolio impacts all the inflows and outflows.
- Net Business Growth: Change in number and amount of exposures indicate the net business growth of the bank. The change in RWA due to this factor can be attributed to business growth. The application determines the new exposures and the exposures that have been closed by comparing the list of the two runs. The difference in the RWA's provide the impact on RWA's of the Net Business Growth.
- Pre Projection Net Revenue (PPNR): PPNR is computed as following:  

$$\text{Net Interest Income} + \text{Non Interest Income} - \text{Non Interest Expense}$$
 Change in PPNR can be computed across the two runs by comparing the preceding calculation for both the runs and reporting the difference as per the reporting requirements provided.
- Gross Income: For this Attribution Variable category, the following attribution variables are monitored to attribute the impact of change in gross income due to the listed attribution variables over the Operational RWA:
  - Net Interest Income
  - Net Non-Interest Income
  - Provisioning
  - Operating Expenses
  - Gain or Loss from Sale
  - Gain or Loss Position on Net Interest Income
  - Irregular gain or loss from Insurance
  - Income from Insurance
- Others: This captures the change in Total Capital Ratio across two runs which could not be attributed to any of the preceding reasons. Computation for this depends on the variables selected while defining an attribution analysis.

For more information the Attribution Analysis screen, refer to Attribution Analysis GUI section.

## Chapter 4 Key Operational Concepts of the Application

### 4.1 *Basel II*

#### 4.1.1 Risk Weighted Assets Calculation

##### Credit Risk

The application supports the computation of Credit Risk Weighted Assets (RWA) as per the guidelines laid out in the Basel Accord. Credit RWA computation is broken down to Credit Risk for non securitized exposures and Credit Risk for securitized exposures.

##### *Non Securitization*

For Credit Risk for non securitized exposures, the application follows Standardized Approach.

##### Standardized Approach

Standardized Approach consists of the following:

- Banking Book Products
- Credit Risk Mitigation
- Over the Counter Derivative Products
- Securities Financing Transaction

##### Banking Book Products

##### Overview

All the credit risk exposures are identified by their product types, counterparty types and their corresponding asset classes by the application. A sample list of products types, party types, mitigant type, credit ratings are pre-defined in the application. However, this list and naming convention differs from one bank to another. Hence, the application re-classifies the bank's data into standard data as per the accord. The application reclassifies the bank's product types and party types to Basel standard product and party types. Then based on Standard Basel product and party types, it forms an asset class for each exposure. For equity exposures, the asset class is formed on the basis of equity type and Basel product type. The application does further data processing based on these standard reclassifications.

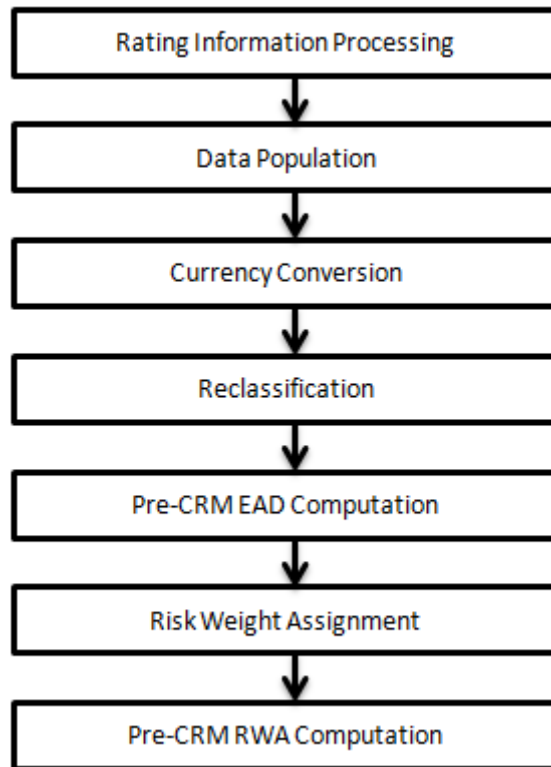
Some exposures may be hedged against credit risk through various mitigants like guarantors, collaterals, credit derivatives, etc. These provide certain mitigation to credit risk and should be considered while computing Credit RWA as per Basel norms. Hence, the application calculates both pre-mitigation exposure amount and post-mitigation exposure amount.

Based on the asset class, the application calculates the pre CRM EAD for each exposure. This value signifies the maximum loss that the bank can take in case of default on this exposure, prior to considering any mitigation effects. Through CRM (Credit Risk Mitigation) 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 may undergo in case of default on this exposure, after considering all the 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 in this case is arrived at by looking at the credit rating of the exposures and mitigants as per the Basel guidelines.

Some credit risk exposures that fall under the category of internal transactions like holding owned subsidiaries shares or investment in its capital, reciprocal cross holding, and so on are treated separately under capital structure.

## Process Flow



- **Rating information processing:**

Pre processing steps: Data for credit ratings need to be updated in the application via following ratings tables:

Accounts Rating Table (STG\_ACCOUNT\_RATING\_DETAILS)- Ratings of all credit risk non securitized exposures except for investment exposures (one that are in **stg\_investments**), securitized exposures, and securitized tranches.

Instrument Rating Table (STG\_INSTRUMENT\_RATING\_DETAILS)- Ratings for all market risk exposures , investment exposures subject to credit risk (one that are in **stg\_investments**), and mitigants.

Party Rating Table (STG\_PARTY\_RATING\_DETAILS)- Credit Rating for all customers and issuers.

Sovereign Rating Table (STG\_SOVEREIGN\_RATING\_DETAILS) - Credit Rating for all countries.

Processing Steps: Banks obtain credit ratings from different sources and these are provided as input in the application through the four rating tables. The application re-classifies the rating information to Basel standard ratings.

The rating reclassification lookup table (**fsi\_rating\_classification**) is used to reclassify all the bank ratings to their Basel ratings. This is done so that the reclassification rule need not be repeated for each of the rating processing tables. Ratings are populated from the stage tables to FSI tables using the lookup table to fetch reclassified rating. Once the application identifies the reclassified ratings, risk weight rules update the risk weights in the rating risk weight mapping table. Then, the multiple assessment DT updates the rating and the risk weights to the exposures. For each exposure, the application checks the risk weight yielded by each of its ratings and assigns the second greatest risk weight and the rating that yields such risk weight to the exposure.

For unrated non securitized exposures, the application does an issue issuer assessment as per the guidelines of Basel Accord. This is done to infer a rating of the unrated exposures, based on the rating

of a similar instrument (referred 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.

- **Data population:**

Pre processing steps: Credit Risk exposures data needs to be loaded in the application for all the product types through their respective input tables known as Product Processors. Main categories of CR non sec exposures, along with their respective table names that are used for data input are as follows:

<b>Higher Level Product Type</b>	<b>Table name for data input</b> (Also known as <b>Product Processor</b> )
Bills	STG_BILLS_CONTRACTS
Credit Cards	STG_CARDS
Swaps	STG_SWAPS_CONTRACTS
Futures	STG_FUTURES
Guarantees	STG_GUARANTEES
Investments	STG_INVESTMENTS
Lease Contracts	STG_LEASE_CONTRACTS
Letters of Credit	STG_LC_CONTRACTS
Loans	STG_LOAN_CONTRACTS
Money market instruments	STG_MM_CONTRACTS
Overdraft	STG_OD_ACCOUNTS
Options	STG_OPTION_CONTRACTS
Re purchase contracts	STG_REPO_CONTRACTS
Equity Exposures	STG_EQUITY_EXPOSURES
Underlying exposures for repo contracts	STG_UNDERLYING_EXPOSURES
Credit Derivatives	STG_CREDIT_DERIVATIVES

Processing steps: Stage data from the Product Processors or other stage tables is populated in the required tables. All product processor data goes to one common Fact table for all non sec exposures (**fact\_non\_sec\_exposures**), except equity data, which is first populated in the respective equity table (**fact\_equity\_exposures**) and is then populated in the common Fact table for all non sec exposures. For more information on the list of columns to be populated within each table, refer to the *Download Specifications* document.

Shareholding Percent multiplication: The exposure amount that is a part of input data (product processors) is the exposure amount for solo entity. However, in case of a consolidated Run, the parent exposure is considered only on the basis of shareholding percentage, based on the following calculation:

$$\text{Exposure amount} \times \text{share holding percent} = \text{Updated Exposure Amount}$$

where Share holding percent is allotted a value by the application during the process- Capital Consolidation in the rule 'Cap Consl Effective Shareholding Percent for an Entity'.

This assignment happens using the Rule '<Attribute > Shareholding Percent Multiplication'. The Rule relates to para 28 of the Basel II Accord. Following attributes undergo shareholding percent multiplication:

- Outstanding Principal
- Current Exposure Amount

- Undrawn Amount
  - Exposure Market Value
  - Exposure Accrued Interest
  - Provision Amount
  - Write Off Amount
  - For OTC products, Notional Principal and Contract Amount undergo shareholding percent multiplication.
- **Currency Conversion:** In this step, the application converts amount data columns that are in natural currency to reporting currency columns which are used for further calculations. The column names suffixed as ‘\_ncy’ are in the natural currency and they are multiplied by currency conversion factor to populate values in the reporting currency. The rule **Reporting Currency Code Assignment** is used to assign the reporting currency in case of a RRF execution.

---

**NOTE:** The data populated in the Product Processor is expected in natural currency of the exposure.

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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, which will be used in cases when the values are missing. For example: if the SETUP\_MASTER is set as mentioned in the table below, then BLOOMBERG will be used to determine the Rate Data Source Code during currency conversion. If the Rate Data Source Code in DIM\_ORG\_STRUCTURE is missing, then USD will be used as the destination currency code.

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

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**NOTE:** 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 screens, if the Run is executed from the Run Execution Screen.

---

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** 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 have been 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 key which is set to -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 key 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 may 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** 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 attached below.



Currency Conversion  
- Tables and Columns

- **Reclassification:** The application reclassifies the bank's product types and party types to Basel standard product and party types. Then, based on Standard Basel product and party type, it forms an asset class for each exposure. Reclassification for equity is done by the application in a separate Rule. Similarly, the application does reclassification for mitigant on the basis of its mitigant type and reclassifies it to standard mitigant type.

Product Type Reclassification:

Product types used by reporting bank in the input data are reclassified to standard product types as recommended by Basel Committee in the US Basel III Final. The product types after reclassification are stored as Basel product types. The reclassification is based on a simple logic. For Example: Housing Loan is reclassified as Residential Mortgage Exposure as per the Basel II guidelines.

Party Type Reclassification:

Similar to the product type, the customer type and issuer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The Basel application is designed to include customer type, issuer type, and legal entity type in a single table (**stg\_party\_master**). This is applicable for both the staging and dimension model. All of them are reclassified together as well. Party type reclassification Rules handle reclassification for customer types, issuer, and entity types. The reclassification is based on a simple logic. For Example: Individual is reclassified as Retail.

Asset Class Reclassification:

In this step, on the basis of Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing.

Some examples for the reclassification are: When standard counterparty is a large corporate, the asset class is large corporate, except when exposure has product types like cash and real estate. For Basel product type gold, the asset class is gold, however when standard counterparty type is Central Counter Party, the asset class is Central Counter Party. For standard counterparty type Corporate Non SME and Basel product type as Loan, the asset class is Corporate Non SME.

Asset class reclassification for all equity products is different, as it is done on the basis of equity type and Basel product type. Asset class reclassification for all mitigants is done on the basis of their standard mitigant type and standard issuer type.

In addition to the above asset class reclassification process for exposures, to ensure it follows the regulatory retail portfolio definition as specified in the Basel Accord the following process is followed:

MAP\_RET\_EXP works based on fct\_non\_sec\_exposures table; particularly on columns like Basel Asset Class, Customer/Issuer, Standard Counterparty type, Basel Product Type, and so on.

This DT checks the Qualifying Criteria requirement of para 70 of Basel Capital Requirement in terms of Orientation Criterion, Low value of individual exposures and Granularity Criterion. Product Criterion and customer as Individual etc is addressed through reclassification.

It checks whether the aggregated exposure to one counterparty exceeds threshold limit based on customer type it updates asset class to either Corporate, Regulatory Retail or others. Granularity check

is performed at the end to check whether total exposure to one counterparty is greater than Granularity threshold (0.2%) of total Regulatory Retail Portfolio. In that case, based on customer type it updates asset class to either Corporate, Regulatory Retail or others. It excludes NPAs from the overall regulatory retail portfolio.

- **Pre-CRM EAD computation:**

Credit Conversion Factor: This is applied to all off balance sheet exposures. The CCF applied values are 0.2, 0.5, and 1. The various factors on the basis of which the CCF is applied are standard product type as per Basel document, type of facility (whether it is cancellable or not) and the maturity of the exposure.

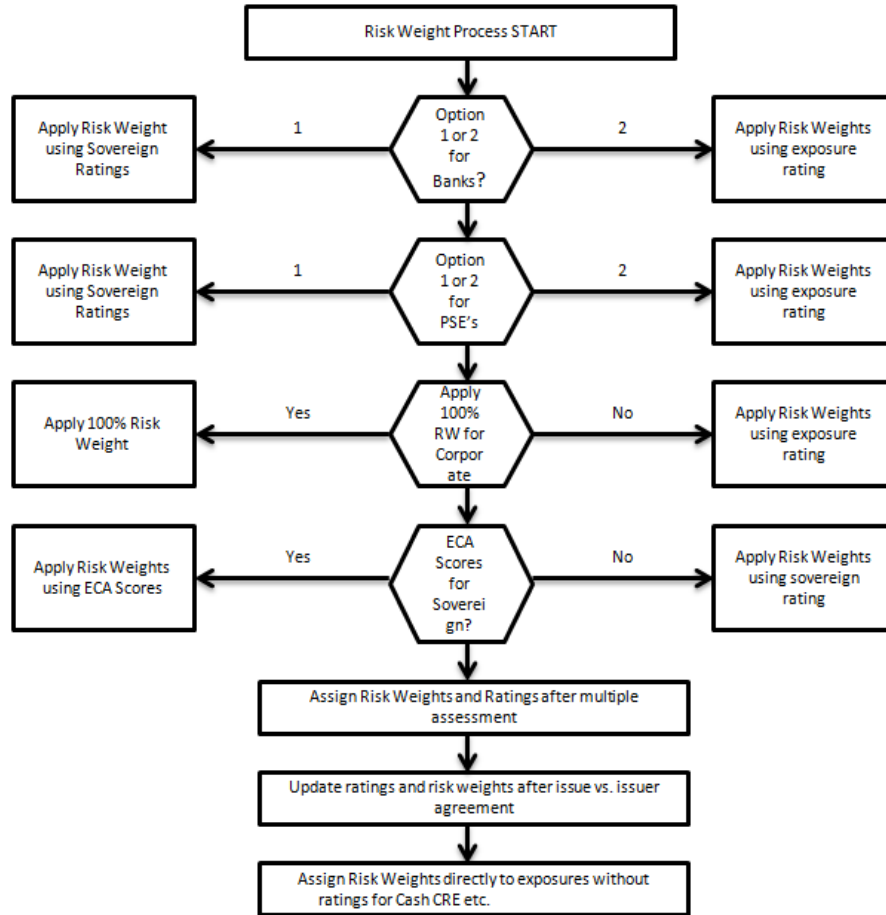
Pre CRM Exposure at default (EAD): Exposure at Default (EAD) is calculated for all asset classes based on the Current Exposure Amount, Accrued Interest, Off-Balance Sheet Drawn CCF Percent, Drawn CCF percent, and Undrawn Amount. Using the same inputs, drawn EAD amount and undrawn EAD amount is calculated. If reporting bank has exposure to one of its own subsidiaries, then that exposure is classified as an internal exposure. Each of the internal transaction that is, transaction between parent and its subsidiary is marked as deduction line item. The deduction is processed as part of Basel II capital structure in the capital structure processing and all the internal transactions are eliminated from any RWA calculation.

In a standardized approach, the exposure at default value of an exposure is calculated using a Rule. It is calculated as,

**(Current Exposure Amount - Non Sec Investment amount which is above Materiality Level for Commercial Entity) \* Off-Balance Sheet Drawn CCF Percent + Undrawn Amount \* CCF Percent + Net accrued but unpaid interest and fees**

- **Risk weight assignment:**

Non Sec exposures Risk Weight: Risk Weight Assignment is done on the basis of asset class and the credit rating. The risk assigned to a particular rating is as per Basel guidelines. The risk weight rules operate on the basis of risk weight table (**FSI\_RW\_MAP\_MASTER**). Highly rated exposures are allocated low risk weight and correspondingly poorly rated exposures are allocated high risk weights. In case the exposure has more than one rating (rated by more than one agency), 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 used. Options for risk weighting are selected during Run definition in case of Run Management Runs or a setup code from **USR\_DEFINED\_RUN\_PARAMETERS** is set in the rule 'Run Definition User Defined Run Param Assignment'. The details on how to set up this table is discussed in the section Run Management.



- **Pre-CRM RWA Computation:**

Pre CRM RWA is calculated for all asset classes by multiplying the Pre CRM EAD with Risk Weight. In the Standardized approach, RWA for Unexpected Loss is calculated as,

**Non Sec Pre-Mitigation Pre-Volatility Haircut Exposure at Default \* Non Sec Risk Weight for UL before Mitigation.**

**Over the Counter Derivative Products**

**Overview**

The Basel committee has introduced Counterparty Credit Risk (CCR) wherein the counterparty could default before the final settlement of a transaction. Unlike the firm’s exposure to credit risk arising from a loan, the CCR creates a bilateral risk of loss. Market value of the transaction can be positive or negative to either party in the transaction at different points in time till the maturity or closure of the transaction. The market value of the transaction depends on the movement of the underlying risk factor. Basel committee has proposed Rules to calculate the exposure at default (EAD) or exposure amount for the instrument with Counterparty Credit Risk.

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**NOTE:** All OTC Derivatives and Repo products are part of CCR computation. Also, all the trades with Central Counterparty (CCP) are assigned a zero risk weight.

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The application’s treatment for the instrument with CCR is divided into three categories:

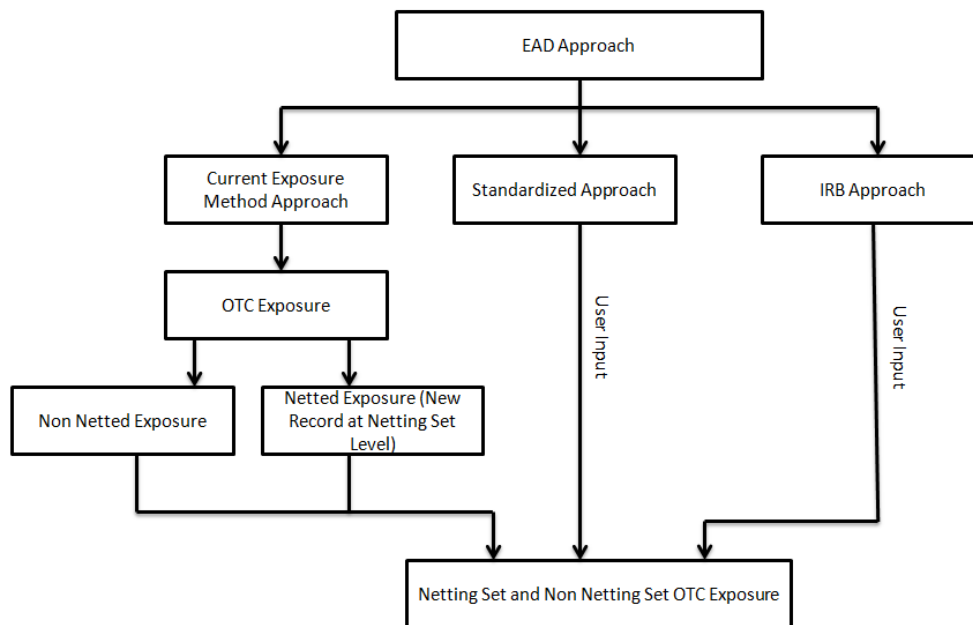
- Exposure at Default (EAD) Approach



- Risk Weighted Asset (RWA) Approach
- Credit Risk Mitigation (CRM) Approach

**Process Flow**

Exposure at Default (EAD) Approach



Exposure amount subject to CCR is estimated by three different approaches as described in the Basel Accord. The application calculates EAD with Current Exposure Method as laid out in Basel Accord. For the other approaches like Standardized approach, the application expects the exposure amount of the transaction as direct user input for further processing.

- **Current Exposure Method:** The application calculates the exposure at default for two different sets of the records with a different methodology as prescribed in the Basel accord -Netting Agreement Records and Non Netting Agreement Records.
- **OTC Exposure:** For the calculation of EAD, the exposure amounts from the exposure table are moved to a different table for OTC and REPO transaction. The application also creates a new record for each netting agreements in the data.
- **Non Netting Exposure:** To compute EAD for non netting records the application reads the following inputs:
  1. Total replacement cost which is greater of Mark to Market or Zero for all the contracts.
  2. An amount for potential future Credit Exposure is calculated based on the notional and multiplied by the add-on factor based on the underlying type of the contracts. Add-on is assigned based on the following as represented in a tabular format.

	Interest Rates	FX and Gold	Equities	Precious Metals Except Gold	Other Commodities
One year or less	0.00%	1.00%	6.00%	7.00%	10.00%

	Interest Rates	FX and Gold	Equities	Precious Metals Except Gold	Other Commodities
Over one year to five years	0.50%	5.00%	8.00%	7.00%	12.00%
Over five years	1.50%	7.50%	10.00%	8.00%	15.00%

The application assigns the add-on percent in the base exposure table by using the Rule: **Non Sec Add - on Estimation**. Data is populated to OTC exposure table by T2T: **NETTABLE\_POOL\_OTC\_POPULATION\_OTHERS**

- **Netting Exposure:** To compute Exposure at Default for the netting agreement records the application reads the following inputs:
  1. Total replacement cost which is greater of Mark to Market for all the contracts.
  2. An amount for potential future credit exposure is calculated based on the notional and multiplied by the add-on factor based on the following formula:

$$A_{net} = 0.4 * A_{Gross} + 0.6 * NGR * A_{Gross}$$

The application creates new records for netting agreement and then populates into the OTC Exposure table. It selects all the records with the following attributes which are similar to computing the netting agreement exposure:

- Trades with Entity
- Customer
- Product Level – All OTC trades
- Netting Agreement
- Book Code: Trading or Banking
- Long Settlement transaction Flag
- GAAP Code

The following T2Ts are used to create and populate the OTC exposure table:

- **NETTABLE\_POOL\_OTC\_POPULATION**
- **NET\_POOL\_EXPOSURE\_CREATION**

The add-on percent netting agreement is achieved by using the following computation Rules:

- CCR Gross Current Exposure Calculation for OTC Derivatives
- CCR Gross Potential Exposure Calculation for OTC Derivatives
- CCR Net Current Exposure Calculation for OTC Derivatives
- CCR Net Gross Ratio Calculation for OTC Derivatives
- CCR Net Potential Exposure Calculation for OTC Derivatives
- Exposure at default for all instruments with CCR risk is calculated using the following Rules:
  - CCR Exposure Calculation for OTC Derivatives
- Standardized Approach: As mentioned earlier, for Standardized Approach you are expected to provide exposure amount inputs for computation.

**Risk Weighted Asset (RWA) Approach**

RWA calculation for the instruments which are subject to CCR risk is similar to RWA calculation of other instruments. Any specific treatment is not applied in the application..

**Credit Risk Mitigation (CRM) Approach:**

CRM calculation for the instruments which are subject to CCR risk is similar to CRM calculation for other instruments. Any specific treatment is not applied in the application.

**Key Data Elements**

A few key data elements need to be noted while computing Counterparty Credit Risk. To view the complete list of tables used for CCR computation refer to the *Download Specification* document.

- For instruments participating in netting agreement, the Nettability flag should be set as 'Y'.
- Instruments with the same agreement code will be netted in the same netting agreement. The application handles both cross product and product netting with respect to netting agreement.

**Credit Risk Securities Financing Transaction (SFT)****Overview**

Securities Financing Transaction includes Repo style transactions, Margin Lending, Security Financing Borrowing; and so on The SFT portfolio of a Bank should be included for capital charge calculations as per standardized approach. The SFT EAD calculation follows two methodologies as outlined below

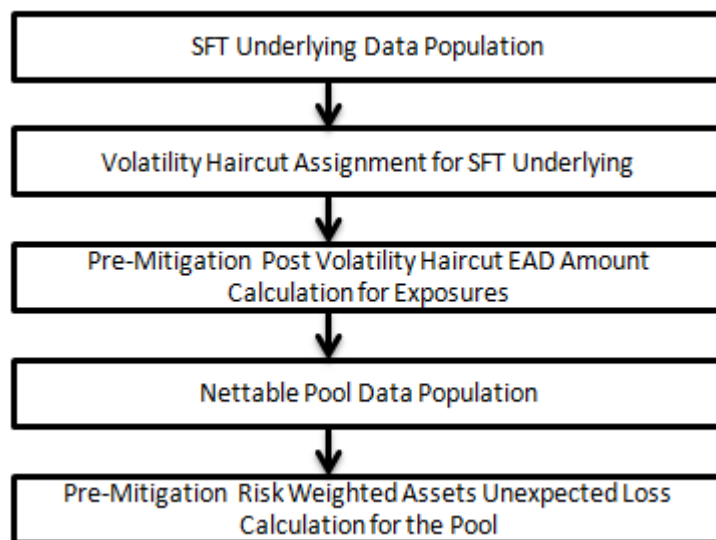
- Collateral Haircut Approach
- Simple VaR Approach

Currently the Basel Regulatory Capital application supports Collateral Haircut approach only.

All SFT contracts which have a mitigant mapped, application does the CRM based on the RWA approach undertaken by the bank. For standardized approach all eligible mitigants will be applied a risk weight on mitigant value post haircut adjustment.

**Process Flow**

SFT EAD calculation is computed in the sub process **SFT Exposures RWA - Comprehensive Approach**.



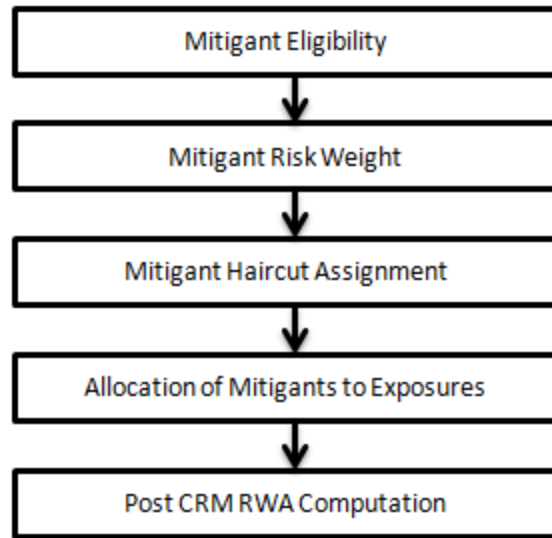
- **SFT Underlying Data Population:** SFT transactions have got two data elements present. First the parent transaction is captured and second the underlying information on which the parent transaction is built is captured separately with a data identifier (Stg\_Underlying Exposures.v\_underlying\_data\_identifier) as **REPO** for Repo transaction or **MLT** for Margin Lending Transaction. Additionally, the underlying data captures parent identifier code against each of the records (**V\_Parent\_exposure\_ID**). For multiple underlying data for a single parent, the unique parent identifier code is repeated across the underlying data.
- **Volatility Haircut Assignment for SFT Underlying:** This is computed by the following Rules:  
Exposure Volatility Haircut Assignment for Supervisory Haircut, CRM Exposure Volatility Haircut for Equity and Mutual Fund, Exposure Volatility Haircut Assignment - Scaling Up for "Capital Market Driven" or "Repo Style" transaction types, Exposure Volatility Haircut Assignment - Own Estimate, Forex Haircut.
- **Pre-Mitigation Post Volatility Haircut EAD Amount Calculation for Exposures:** For SFT transaction, the application calculates EAD for the parent exposure based on the underlying information. The underlying exposures are moved to **FCT\_SFT\_UNDERLYING** table from **FCT\_NON\_SEC\_EXPOSURES**. Each underlying exposure is assigned volatility haircut based on haircut application criteria, if the underlying exposures happen to be financial instruments and forex haircut where the underlying and the parent contract are in different currency. Each SFT underlying exposure adjusted for haircut (EAD + haircut value) is added as EAD for the parent contract.
- **Nettable Pool Data Population:** The application nets SFT contracts based on the same customer, common netting agreement identifier, transaction being Repo/Re-Repo or Margin lending, product book being trading or banking, and so on. Margin lending transaction being SFT also follows the same EAD calculation methodology but netting of Repo/Reverse Repo and margin lending are not done together.
- **Pre-Mitigation Risk Weighted Assets Unexpected Loss Calculation for the Pool:** Pre-Mitigation Risk Weighted Assets Unexpected Loss is calculated for the pool as EAD multiplied by risk weight or capital \* 12.5.

## Credit Risk Mitigation

### Overview

The application handles multiple mitigants for credit risk mitigation like financial collateral, On-Balance sheet netting, Guarantees, Credit derivatives, etc. CRM reclassification is done by reclassifying Collateral and issuer to standard collateral and issuer type. The mitigant is identified as eligible or not based on the eligibility rule test for CRM.

### Process Flow



- **Mitigant Eligibility:** The mitigant is identified as eligible or not based on the eligibility rule test for CRM as mentioned in Basel II accord. Credit rating of the collateral is considered for all mitigant types issued by all party types while deciding whether mitigant is eligible for a particular exposure or not. The application has configured Rules that carry out these eligibility checks. There are separate eligibility Rules for mitigants types that are equity, mutual funds, or debt security. 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 if it is classified as senior in position.

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 1 year and residual maturity is more than 3 months.

- **Mitigant risk weight:** Similar to non sec exposures, collaterals or mitigants are also assigned a risk weight based on their issuer type, credit rating, and original maturity of the mitigant. For financial collateral, under the BIS Standard Approach, the RW used is 0. For mitigants issued by bank, the application offers two choices for calculating RW on the basis of credit rating:

Option I

Option II

- **Mitigant haircut assignment:** The application does computations for three kinds of mitigant haircut which are volatility haircut, forex haircut, and maturity mismatch haircut. Volatility haircuts are calculated and amount of the exposure to the counterparty and the value of collateral or mitigant is adjusted to account for any future fluctuations in the market value. After the adjustment, the application gives the volatility adjusted amounts for both exposures (higher than original exposure amount) and collateral (lower than original amount). When the exposure and collateral are in different currencies, the application makes an adjustment by applying forex haircut. When the residual maturity of the CRM is less than that of the underlying credit exposure a maturity mismatch occurs. When there is a maturity mismatch and CRM has an original maturity of more than a year, maturity mismatch haircut is applied to adjust the value. The application assigns volatility haircut using Supervisory Haircut method.

In case of Supervisory Haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant as per Basel II accord. The forex haircut is also assigned based on these transaction types as per Basel II accord. Only eligible mitigants are considered for haircut assignment and for further processing. The eligible mitigants are moved from mitigants table to sub exposures table.

- **Allocation of Mitigants to Exposures:** The application has a pre-built optimizer for optimum allocation of mitigants to the exposures for credit risk mitigation purposes. One-to-One, Many-to-One and Many-to-Many mapping of mitigants are handled in an efficient manner involving storage of intermediate computations for traceability.

All mitigants which are eligible and mapped to an exposure are then populated to a new table where each exposure is broken down by mitigant type, which includes an additional row treating the exposure as having covered and uncovered portion. The covered factor and uncovered factor is also populated in this table.

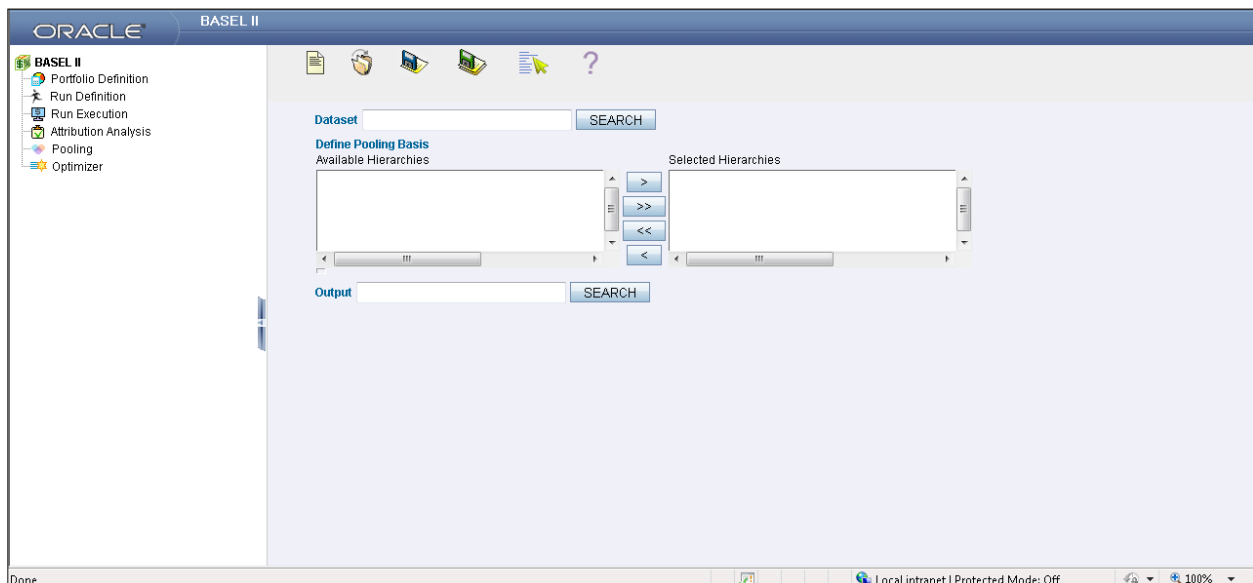
The application uses linear programming logic to allocate the mitigants to the exposures. Pooling identifies the exposure and mitigant data from sub exposures table. Exposure Identifier and Mitigant Identifier are the attributes on which pooling is performed. It assigns the pool id for each exposure-mitigant combination. Based on these pool ids optimizer task allocates covered factor to exposures. Optimizer does the optimum allocation of mitigants to exposures. For more information refer [Mitigant Allocation Optimizer](#).

**NOTE:** A tag <ALTER\_STATEMENTS> is present in Optimizer\_Config.xml. This statement is used to enable the parallel Data Manipulation Language (DML) for optimizer. By default this will be disabled. Due to which a warning appears as follows which will be printed in the Optimizer log:

“Error: Could not find node ALTER\_STATEMENTS in the xml”

The administrator can uncomment this tag, to enable parallel DML for the optimizer.

1. Click the Basel Regulatory Capital link under Risk Applications section on the main screen.
2. Click the Pooling tab.



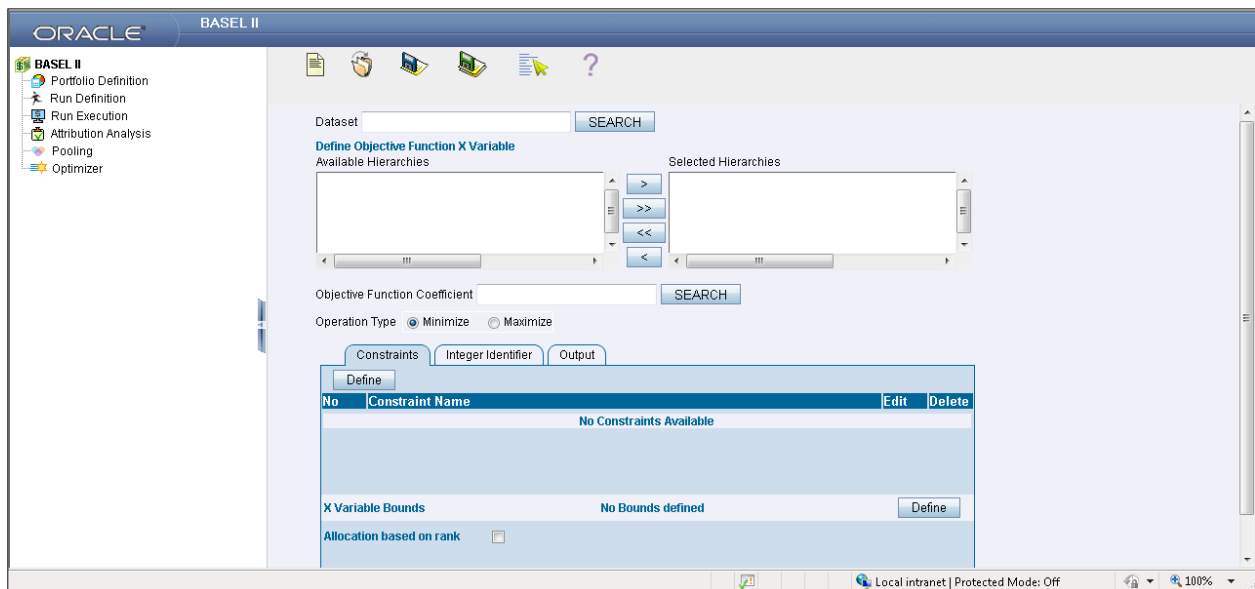
3. Search for the dataset on which pooling needs to be performed from the available list.
4. Define pooling basis. Here you can select hierarchies from available hierarchies. Pooling is done based on the combinations of the selected hierarchy. In the output tab you can select the measure for pooling output.

Once all the parameters are selected you can save the definition in the desired segment. This pooling definition can be added in pooling task for execution. On successful execution it assigns pool ID to exposure-mitigant combination.

A pre-requisite for Optimizer is to update the pool id in Sub Exposures table for a selected Run.

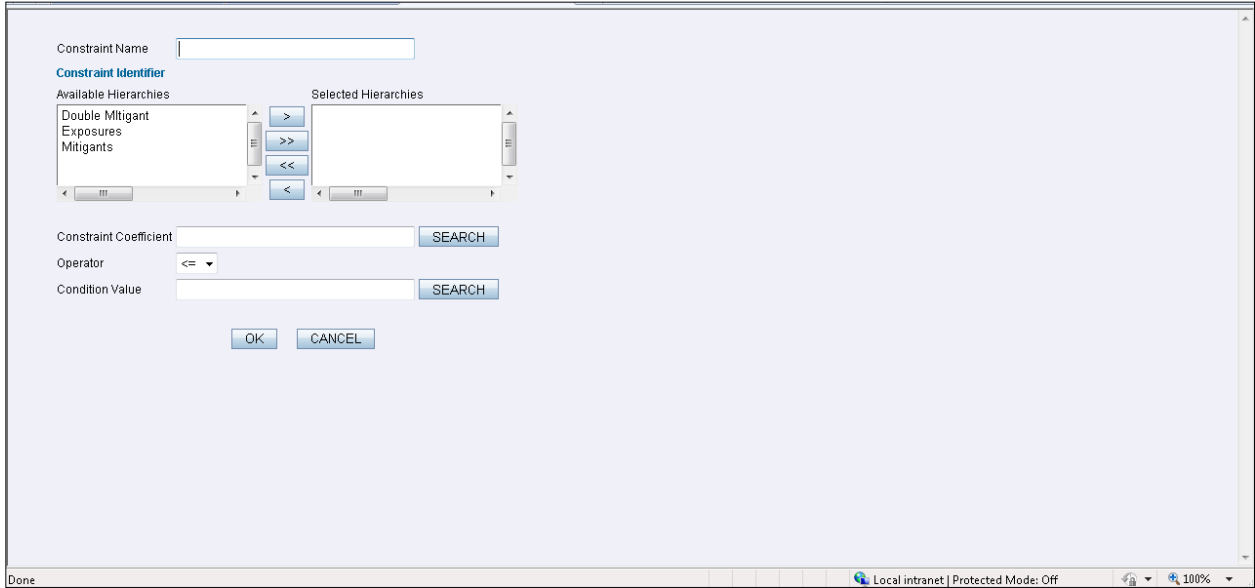
Optimization definition:

1. Click the Basel Regulatory Capital tab under Risk Applications section on default screen.
2. Click the Optimizer tab.

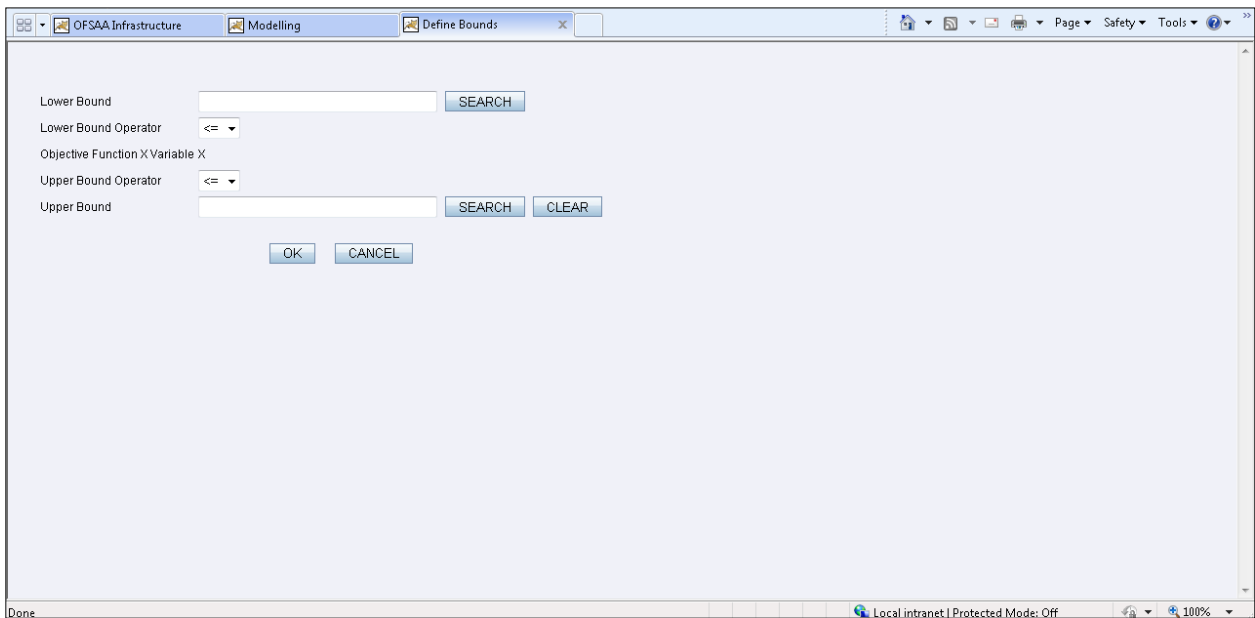


To create a new definition you need define the following:

- Dataset – choose from search box
- Objective Function X Variable – once you select dataset, you will get list of available hierarchies. You can choose one or more hierarchies from left to right.
- Objective function Coefficient-choose from search box.
- Operation Type – choose one of the minimize or maximize
- Constraints-Click Define tab. Here you need to give constraint name. Choose constraint identifier from available hierarchies. Constraint coefficient and condition value can be selected from search box. Then choose one of the available operators from drop-down box.



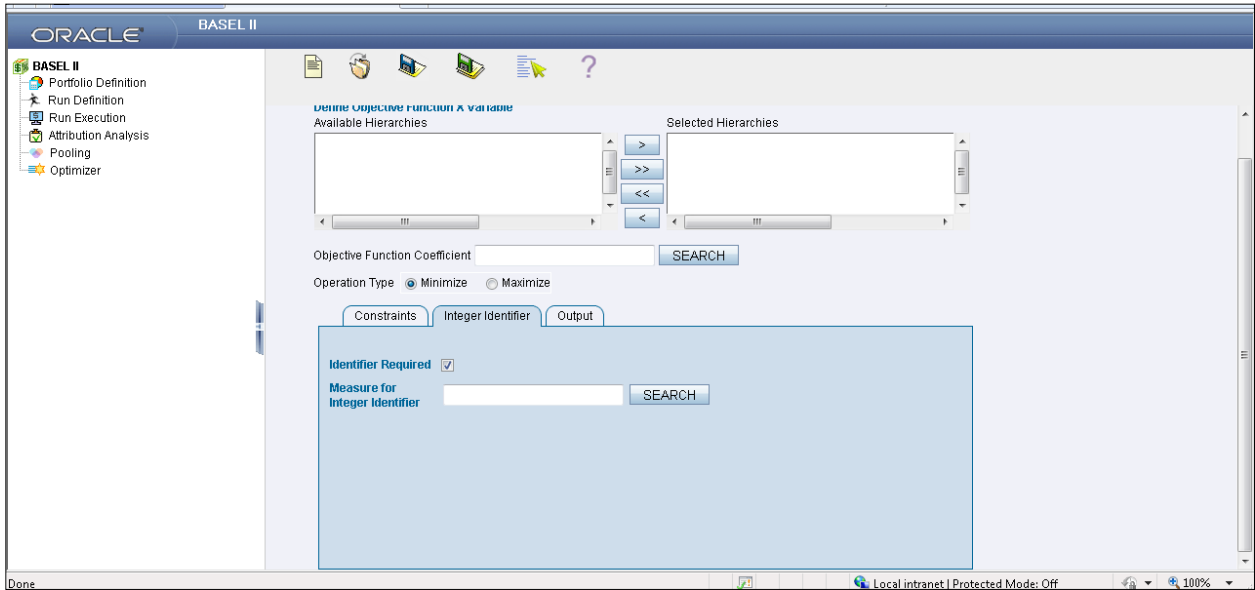
3. Click define to define X variable bound.



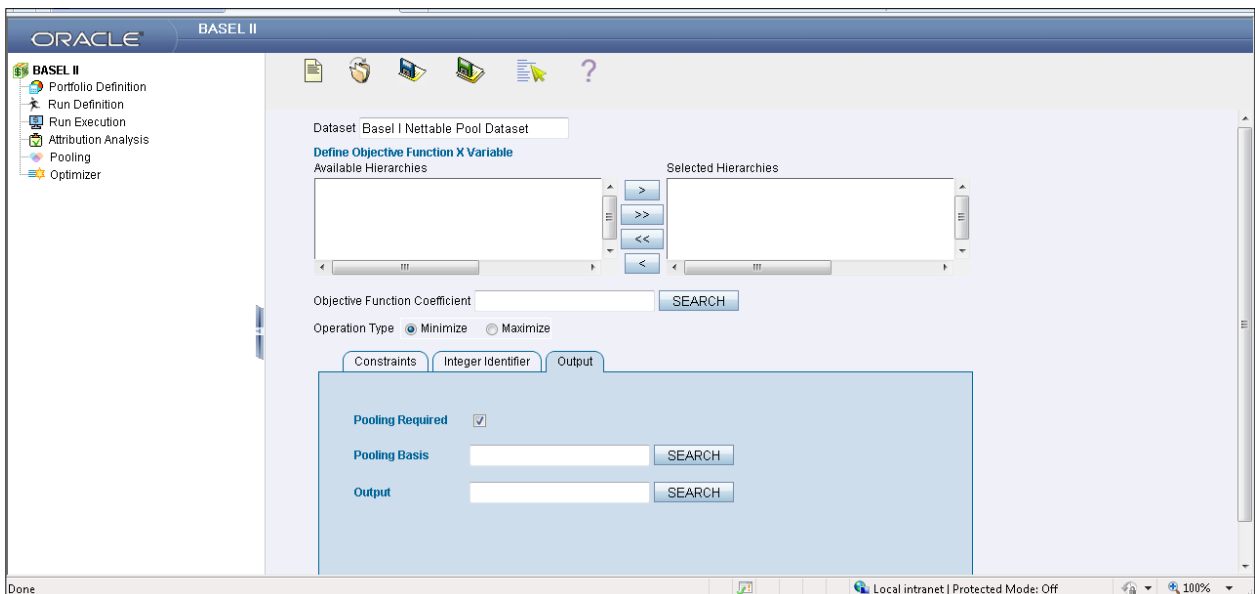
Here you can select lower bound and upper bound with one of the available operators.

4. Choose measure for identifier from available list in the Integer Identifier tab.





5. Select in which measure you want the output of optimizer. Here you have another option to choose pooling required or not if required it again asks for one of the available measures.



Once all the input parameters are given you can save the definition with proper name in the desired segment. This definition can be added in the optimizer task for the execution. Optimizer updates the covered factor for each exposure based on the objective function and the constraints defined by you

### Mitigant Allocation Optimizer

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

The treatment of each of the pooled cases in the optimizer engine has been detailed in the following section.

#### One or Many Exposure to One Mitigant

The Case, *one or many exposure 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, the exposure with the lowest currency mismatch haircut or maturity mismatch haircut is selected for allocation.
- 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.
- The post-haircut mitigant amount is applied to the exposure based on the above 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
- 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.
- After all the mitigant eligibility checks are done then the computation starts by calculating the covered factor for the first row which is as follows:
- $f1 = (Mitigant\_value * Haircut) / EAD.$
- $Where\ Haircut = (1 - volatilityHaircut - forexHaircut) * MaturityMismatchHaircut.$
- 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.

---

**NOTE:** Covered Factor is Sum of all Covered amount + Uncovered amount of the mitigant upon its total EAD

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#### Many Exposures to Many Mitigants

In the Case, *many exposures to many mitigants* the Optimizer uses a linear programming technique for which you need to 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 should 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:  $\left[ \frac{E1 * x1}{(1-V-Fx1)*(Mm1)} \right] + \left[ \frac{E2 * x2}{(1-V-Fx2)*(Mm2)} \right] + \left[ \frac{E3 * x3}{(1-V-Fx3)*(Mm3)} \right] \leq M1$

Where,

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

- Allocation engine updates the covered factor for each exposure based on the above objective function and the constraints defined by you.

- Post-CRM RWA Computation

Post CRM RWA is calculated by multiplying Post mitigation EAD corresponding Risk Weight. Post Mitigation EAD is a summation of Covered and Uncovered exposure amount for each account.

## ***Securitization***

### **Overview**

Basel Accord differentiates the credit risk computation of the securitized exposures from the other non-securitized exposures. This is because the securitized exposures are part of an off-balance sheet transaction and they follow a waterfall cashflow mechanism, unlike the other exposures. After the economic crisis of 2008, the Basel rule differentiated the securitized exposures into the securitized and resecuritized exposures as securitization was one of the main reasons for the economic crisis.

The securitized exposures are the exposures which are issued out of a pool of underlying exposures for the transfer of risk. The resecuritized exposures are the exposures which are issued out of a pool of underlying exposures which constitutes non-securitized exposures as well as some portion of securitized exposures. The application is capable of handling the securitized exposures as well as the resecuritized exposures. It also handles the calculation for the Originator as well as the Investor bank roles. At a broad level, there are two categories of Investors:

- An Investing Bank who has invested heavily in securitization.

These kind of investors are prepared to provide the entire details of the securitization transaction

To cater to these investor needs, the entire pool, entire or invested tranche details and the invested exposures information are required to be provided by the Bank. This information is captured in the pool, tranche and exposures table.

- An Investing Bank who has invested minimal in securitization

These kinds of investors are prepared to provide the necessary inputs required for the calculation of the capital charge pertaining to their invested exposure.

To cater to these investor needs, the invested exposures information is required to be provided by the Bank. Along with that, few of the pool and tranche attributes required for the computation are required to be provided by the Bank in the exposures table itself.

Basel Accord specifies two broad approaches for the calculation of the capital charge for the Securitization exposures.

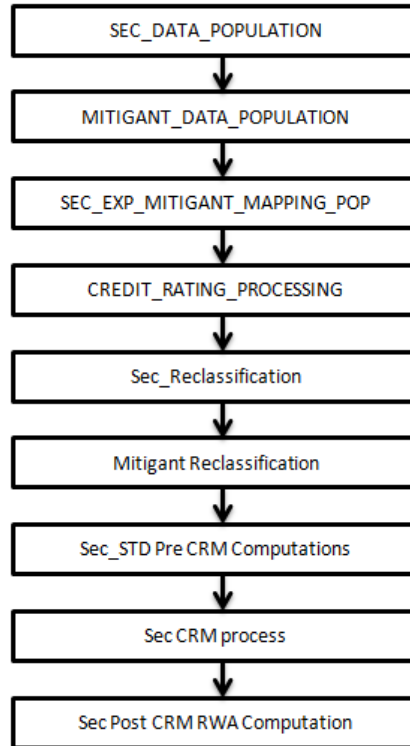
- Standardized Approach

The application handles both the approaches. In few of the computations, the calculations pertaining to the underlying exposures of the securitization transaction are required. This is done before processing the securitization exposures. This is applicable in the case of Basel III Standardized Approach. This change has an impact for both the Securitized Exposures and the Non-Securitized exposures.

### **Process Flow**

#### **Standardized Approach**

The application handles the Standardized Approach of the Securitization Exposures as follows:



- **SEC\_DATA\_POPULATION, MITIGANT\_DATA\_POPULATION, and SEC\_EXP\_MITIGANT\_MAPPING\_POP:**

The data pertaining to the pool, tranche, exposures are populated from the staging tables to the processing tables. The underlying exposures data are captured in the respective product processor tables (and for these information, the process pertaining to the non-securitization exposures is followed). In the case of Reporting Bank providing only the exposure level information, the application expects few pool level and tranche level parameters which are required for further processing, to be provided in the Exposures table. The mitigants data are populated from the staging table to the processing table. The exposures which are mapped to the mitigants are captured and this is also populated from the staging table to the processing table. Securitization Data Population has been handled in the Process **SEC\_DATA\_POPULATION**. Mitigant data population has been handled in the Process **MITIGANT\_DATA\_POPULATION** and Exposure Mitigant Mapping Population has been handled in the Process **SEC\_EXP\_MITIGANT\_MAPPING\_POP**.

- **CREDIT\_RATING\_PROCESSING:** All the 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 tables and the mitigants rating information are captured in the instrument rating details. This is handled in the **CREDIT\_RATING\_PROCESSING** process.
- **SEC\_RECLASSIFICATION and MITIGANT RECLASSIFICATION:** The application uses the standardized data for all kinds of calculation (Product type like Eligible Liquidity Facility, Bank Role like Originator, Pool Type like Mortgage Backed Securities). Before any calculation the application reclassifies the Bank specific data to standard data, similar to the Basel accord terms. It reclassifies the Bank role to the standard Bank Role of an Originator or Investor. Any other bank roles like Sponsor, Credit Protection Provider and so on, will be reclassified into Originator, Investor and so on respectively. The application also reclassifies the Pool Type to the standard Pool Type like Credit Cards Receivable Pool, Auto Loans and so on. It also reclassifies the Product type to the Standard Product type like Mortgage Backed Securities, Eligible Liquidity Facility and so on.

In the case of mitigants also, the application reclassifies the mitigant type to the standard Mitigant type like the debt securities, credit derivative, cash and so on. It also reclassifies the Mitigant Issuer type to the standard

Mitigant Issuer type like Banks, Corporate and so on. The reclassification tasks are present in Sec reclassification and Mitigant reclassification sub process. The application assigns 'Sec - Standardized Approach' in the **Sec Reclassification** Sub Process. This is done for approach selection.

- **Sec\_STD Pre CRM Computations:** The application calculates the Pre-CRM RWA for the exposures by multiplying the Pre-CRM EAD with the Risk Weight of the exposures. This is handled in the Sec STD Pre CRM Computations sub process. The exposures which are below investment grade and the unrated exposures are deducted from the capital. This is handled in the Sec Deduction sub process.

- Risk Weight Assignment: The application assigns the risk weight to the exposures based on the external rating assigned to the exposures. If the exposures have internal ratings assigned, the application treats the exposures as unrated. Initially the risk weight assigned to each of the ratings is assigned and then the multiple assessments is applied by the application. In the case of multiple ratings assigned to the exposures, the application applies the multiple assessments and assigns the ratings which are the worst of the best two ratings.

Then, the application updates the rating after multiple assessments and the corresponding risk weight to the exposures. In the case of securitization and resecuritization exposures, the risk weights assignment are different from the non-securitization exposures. The application assigns the risk weights based on the Bank role, whether the exposure is an exposure issued out of a Securitization or Resecuritization pool and then the external ratings assigned to the exposures. In case of unrated exposures, the application applies the look through approach and assigns the weighted average risk weight of the underlying exposures.

The application also handles other securitization exposures like the Eligible Liquidity Facility, Exposures in a second loss position and issued to ABCP Program, and so on. If the data is not available to assign a risk weight, the application marks these exposures for deduction. Risk weights corresponding to the external ratings are assigned in the entity Securitization Risk Weight Map Master (FSI\_SEC\_RW\_MAP\_MASTER) and the final applicable risk weight is updated in Securitization Exposures after the multiple assessments of the ratings.

- Pre-CRM EAD Computation: The application assigns the credit conversion factor (CCF) to the off-balance sheet items as specified by the Basel Accord. The CCF percentages are assigned based on the Bank Role (this is applicable only for the Originator Bank Role), the Product Type (like the Eligible Liquidity Facility) and the applicable ratings. The CCF Percentages are also assigned to the exposures based on whether there is any Early Amortization provision applicable to the transaction. In those cases, the CCF assignment are based on the Early Amortization type (controlled or uncontrolled), the Pool Type and the ratio of three month average excess spread to the trapping point. Then, the application computes the Pre-Mitigation EAD. This is computed based on the Bank role and the Product type. The application calculates the EAD for the Investors and the Originators separately based on the calculations given in the Basel II Accord.

- **Sec CRM Process:** Mitigant Eligibility, Mitigant Risk Weight, Haircut Assignment and Allocation of Mitigants to Exposures are handled in Sec CRM sub-process.

- Mitigant Eligibility: The application identifies the eligible mitigants based on the criteria as mentioned by the Basel Accord. It identifies the following mitigants in the case of securitized exposures – Collateral, Guarantees and Credit Derivatives. The application is capable of using the Simple Approach as well as the Comprehensive Approach for the mitigants which are part of the collateral. This is similar to the mitigant eligibility of the non-securitization process.

The application processes the multiple assessments of ratings for the mitigants also. This

is required since some of the mitigant eligibility criteria are based on the ratings and risk weight of the mitigants. 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 type, the credit rating assigned to the mitigant or the party (as applicable) and whether the collateral is classified as a senior or not. In the case of equity, the eligibility is based on the main index equity and the equity trading status. In the case of Mutual funds, the eligibility is based on the eligible mutual fund indicator.

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. In the case of Nth to default Credit Derivatives, the application further identifies the eligible credit derivative, based on the number of defaults in the exposures and the defaulted position covered by the mitigant. The application identifies the number of defaults in the tranches based on the attachment point of the tranche to which the exposure belongs, the initial pool exposure amount and the cumulative exposure amount. Then it computes the number of tranches in default and compares that with the defaulted position covered by the mitigant.

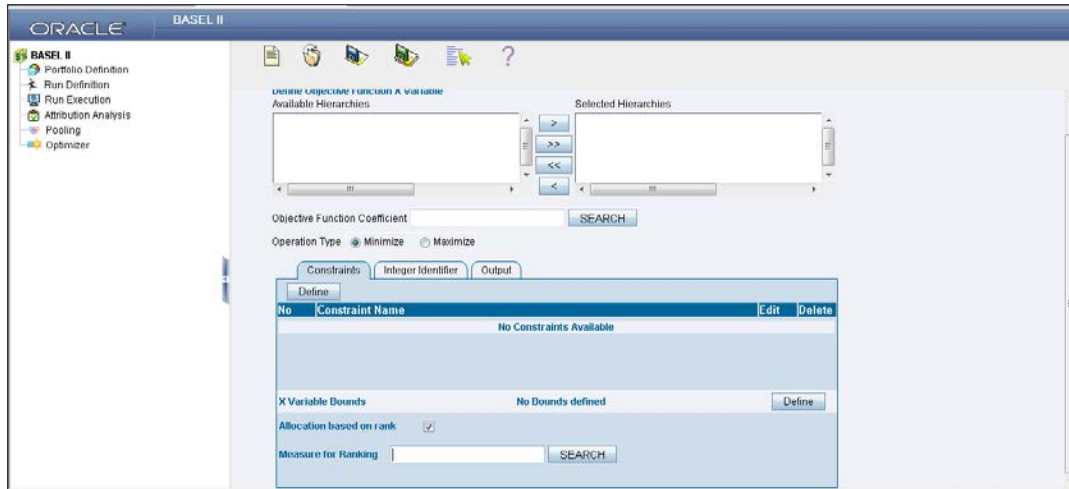
Based on the criteria of eligibility mentioned in the Basel Accord, the application identifies whether the mitigant is eligible or not, and if eligible, the application also makes the least risk weighted exposure as the eligible mapping, for the least eligible nth to default mitigant for the exposure. It also identifies the eligibility of the mitigants based on the comparison of the risk weight of the exposures and the mitigants. If the mitigants risk weight is lesser than that of the exposures, then the mitigants become eligible. Else the application makes them ineligible.

- Mitigant Risk Weight: The application calculates the mitigant risk weight similar to the exposure risk weight of non-securitized exposures. This is based on the Issuer type and the credit rating which includes the unrated issuers as well. The application performs the multiple assessments for the mitigants, similar to the process followed in the case of non-securitized exposures, and arrives at a single rating for the mitigant. Then, the application assigns the final risk weight to the mitigant. In case of financial collateral mitigants like cash, and gold zero risk weight is assigned.
- Haircut Assignment: The application assigns the various haircuts, as applicable to the Mitigants. In case of collateral following simple approach for recognition, there are no haircuts assigned to the Mitigant. In case of collateral following comprehensive approach, the application is flexible to use supervisory haircuts, and scale up if required based on the minimum holding period or use the Bank's own estimate of haircuts. The application applies the volatility haircut, forex haircut and the maturity mismatch haircut to the mitigants as appropriate. This is as per the Basel Accord regulations. Only eligible mitigants are considered for haircut assignment and for further processing. The eligible mitigants flows from mitigants table to sub exposures table.
- Allocation of Mitigants to Exposures: The application computes the mitigant value post all haircuts. Then, it uses the pooling and optimizer logic to allocate the exposures to the mitigants. This is slightly different from the optimizer logic of non-securitization exposures as the securitized exposures have the seniority in the cashflow and always the senior most exposure gets the maximum protection by the mitigants. The senior most exposure (or tranche) is denoted with seniority 1 and the second senior exposure is denoted with seniority 2 and so on. In the case of securitization exposures, always the mitigants is given preference to the senior most exposure and then to the other exposures based on the seniority. The other parameters which are considered in the allocation logic are the risk weight and the mitigant value post haircut.

The application uses the linear programming logic to allocate the mitigants to the

exposures. The pooling logic in securitization is same as of that non-securitization. The optimizer logic for Securitization is slightly different and the difference is explained below:

Based on the seniority of the exposures, risk weight of the exposures and the mitigant and the mitigant value, the rank order in which the mitigants are allocated to the exposures is arrived at. The order of allocation can be changed by editing the database function. You can choose the allocation rank measure in the optimizer definition screen while defining the optimizer logic.



The remaining steps for creating optimizer definitions are same as those mentioned in non-securitization process. The optimizer works on the minimization constraint logic.

#### *Single Mitigant mapped to Single or Multiple Exposures*

If there are one or more than one exposures mapped to a single mitigant, the mitigant is allocated to the exposure with the highest seniority

If there are more than one exposures with the same highest seniority, then the mitigant is allocated to the exposure which yields the highest mitigant value post haircut

#### *Single Exposure mapped to Single or Multiple Mitigants*

If there are one or more than one mitigants mapped to a single exposure, the least risk weighted mitigant will be allocated to the exposure

If there are more than one mitigants with the same least risk weight, then the mitigant which has the highest mitigant value post haircut will be allocated to the exposure

#### *Multiple Exposures mapped to Multiple Mitigants*

This are treated as cases of single mitigant mapped to single or multiple exposures for the identification of the mitigant which has to be assigned to the exposures. Then, the treatment pertaining to single exposure mapped to multiple mitigants have to be followed to yield the credit risk weighted exposure amount.

Using the above logic, the application calculates the factor of exposure covered by the mitigant and the factor of the exposure uncovered (without any protection).

- **Sec 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,



and 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.

$$\text{Post-CRM RWA} = \text{Covered Amount} * \text{Risk Weight of the Mitigant} \\ + \text{Uncovered Amount} * \text{Risk Weight of the Exposure}$$

This logic is handled in Sec Post-CRM RWA computation sub process.

All the below sub process and tasks are handled in the "SEC\_STD" Process – Sec Reclassification, Mitigant Reclassification, Sec STD Pre-CRM Computation, Risk Weight Assignment, Pre-CRM RWA Computation, Mitigant Eligibility, Mitigant Risk Weight, Haircut Assignment, Allocation of Mitigants to Exposures and Post CRM RWA Computation

### **Key Data Elements**

A few key data elements for Securitization computation is as follows. For a complete list of tables and columns refer to the Download Specifications document.

#### ***Securitization Exposures (Standardized Approach)***

- The Key attributes required in the case of an Investor or Third Party who does not provide the complete pool and tranche details are as follows: Credit Enhancement Level, Pool Exposure Amount, Sec Second Loss Position of the Tranche, Granularity of the Pool, Largest Exposure of the Pool, Seniority of the Tranche, Sec Trading Book Approach.

#### ***Mitigant Eligibility (Standardized Approach)***

- Eligible Mutual Fund Indicator, Main Index Equity Indicator, Equity Traded Indicator

#### ***Miscellaneous***

- All tranche information regardless of whether Bank has Exposure or not – required for inferring the ratings, credit enhancement level computation, eligibility of nth to default credit derivative mitigant
- Mitigant Value to be assigned at an Exposure level (not to the tranche)
- Mitigant Pool Id in the Exposure Mitigant Mapping table for nth to default mitigants – Required for eligibility of nth to default credit derivative mitigant
- Attachment point of tranches based on original balances – Required for eligibility of nth to default credit derivative mitigant

## **Market Risk**

### ***Overview***

Basel Committee introduced Market Risk capital charge calculation in 1996 as an Amendment to the earlier Basel accord looking at the risk born by a financial institution having exposures in the trading book. BIS defines Market risk as “the risk of losses in 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

Basel outlays two basic approaches for calculating the capital charge for Market risk

- Standardized Approach
- Internal Model Method Approach

***Standardized Approach***

In standardized approach (STD Approach) the market risk capital charge need to be calculated for the following instrument types

- Interest Rate related instruments (IR Instruments)
- Equity Position Risk
- Foreign Exchange risk
- Commodities
- Options

**Pre-requisite for MR processing**

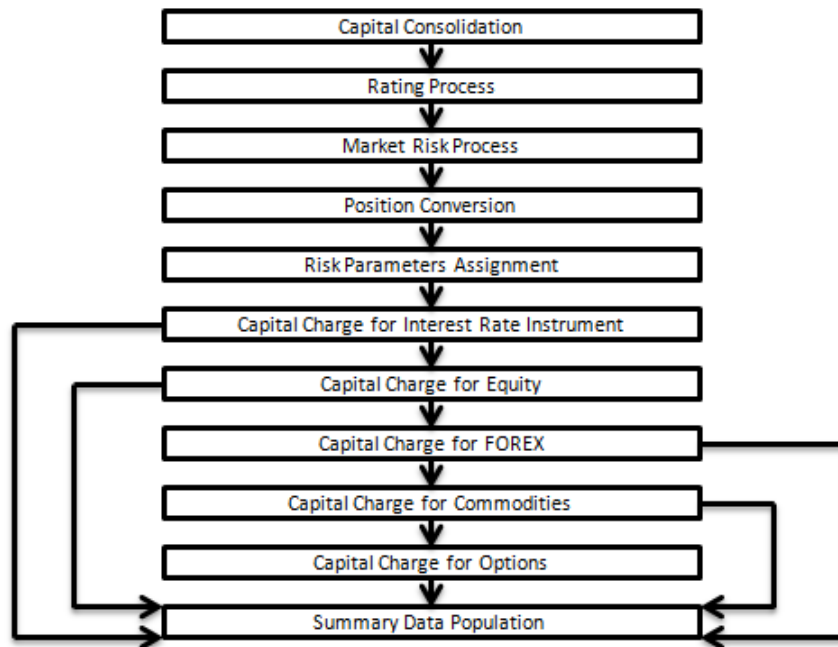
**Staging Data Population – Market Risk**

Execution of the Run, **Staging Data Population - Market Risk - BIS Standardized Approach** is usually a onetime activity. This should 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.

- IRC Data
- Market prices of the instruments
- Bank positions

This Run populates the instrument-level data i.e. 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 table. This data will be moved to 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 table. This data is further moved to fact table. For IR instruments the interest rate required is captured in IRC Rate Hist table. This data is moved to fact table. This data is required for term structure i.e. used in Modified Duration and Greeks parameter calculation.

## Process Flow



- **Capital Consolidation:** For a reporting bank the level at which the consolidation is done is identified by the application. You can choose solo or consolidation level for each entity in the rule present in the capital consolidation process. This particular process handles entity level details. The entity data is captured in Legal Entity Details table. All the child entities underlying a parent will be considered for RWA consolidation. When consolidation is the level selected for a reporting bank, each child entity data is consolidated with the parent entity post Entity shareholding percent multiplication.
- **Rating Process:** Rating data is expected for all instruments which bears an interest rate risk. The rating data is reclassified into Basel equivalent standard rating and the standard rating is considered for assigning specific risk charge for each interest rate instrument. In case there exists multiple ratings for the same issue, the application does a multiple assessment check as per the multiple assessment logic detailed in the Basel II guidelines.
- **Market Risk Process:** Market Risk Process includes position conversion and capital charge calculation for each instrument type as detailed below

**Position Conversion:** Position conversion is done 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 positions in equities, commodities, gold, currencies, etc., only one leg is exposed to interest rate and other leg is exposed to the respective asset (equity, forex, etc.) as the case may be. The following information is required for position conversion: Long/Short position, Value of Notional Position, and 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 below methodology:

- Notional positions in actual debt securities is valued as the nominal amount underlying the contract at the current market price of the debt security; and
- Positions in zero-specific-risk securities is valued using one of the below two methods
- A firm must use one of the following two methods for its position in zero-specific-risk securities arising from above

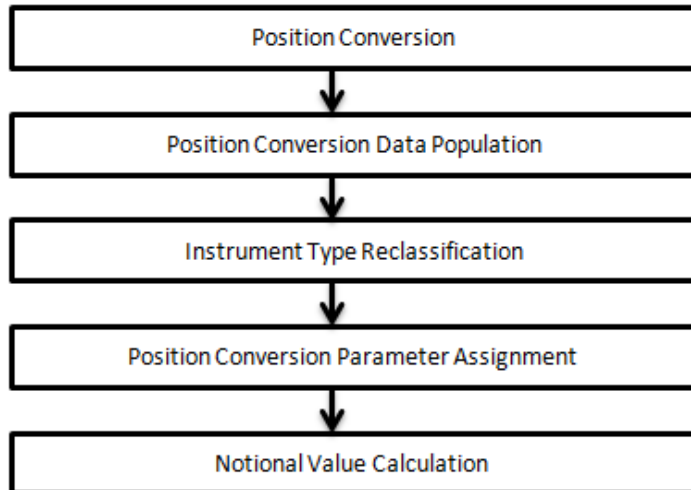
- The present value approach, under which the zero specific-risk security is assigned a value equal to the present value of all the future cash flows that it represents; or
- The alternative approach, under which the zero specific-risk security is assigned a value equal to
  - The market value of the 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
- In case of 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, etc

### **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
  - Puttable Bonds
  - Floating Rate Notes with Caps
  - Floating Rate Notes with Floors
  - Reverse Floaters
  - Leveraged Floaters

The process flow of Position Conversion is as follows:



**Data Population:** The application takes the contract details from instrument table and breaks each contract into multiple positions into 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. So for each long position and nature of contract type, the application creates 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 (i.e. double the notional amount and half the fixed interest rate);
- A short position in a floating rate bond (i.e. 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 as already explained earlier).

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**NOTE:** Reverse Floater: As in Investopedia “A floating-rate note in which the coupon rises when the underlying reference rate falls. The floating rate resets with each coupon payment and may have a cap and/or floor”

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**Instrument Type Reclassification:** The application reclassifies all bank instruments into standard instrument type 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

**Position Conversion Parameter Assignment:** After doing position conversion that is, breaking each instrument into long and short leg, the application does instrument parameter assignments 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, etc. are updated from parent information. This information are used in identifying instrument 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.

**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. 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 skeys. The categories are Qualifying and sovereign and the ratings are picked from standard Basel Rating table. There is some dependency on different instrument types like the exotic options may further result into normal option after position conversion, so the position conversion should happen always as per following order of instrument types:

- Exotic Options
- Options.
- Basket Futures
- Swaps
- Forwards Futures
- Credit Derivatives

After position conversion of Basket Futures instrument types, we do position offsetting on different position of same kind of instrument types and reach at post offset exposure amount.

**Example of a Forward Rate Agreement (FRA) Position Conversion:**

A purchased FRA may be depicted via 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 above position is broken down into two opposite zero coupon bond positions as given below:

**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 will have positions exactly opposite to the one given in the example above i.e. the long position will become short and vice-versa with the value, maturity and coupon remaining the same.

It may be noted that the actual discount rates for discounting the notional values of the two legs in the above example will be 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% has been taken in the above example. For the above example, application steps are detailed below.

First the FRA as contract is captured in the contract record details table with banks position in the contract in the position table. The application also captures the position mapping table for the

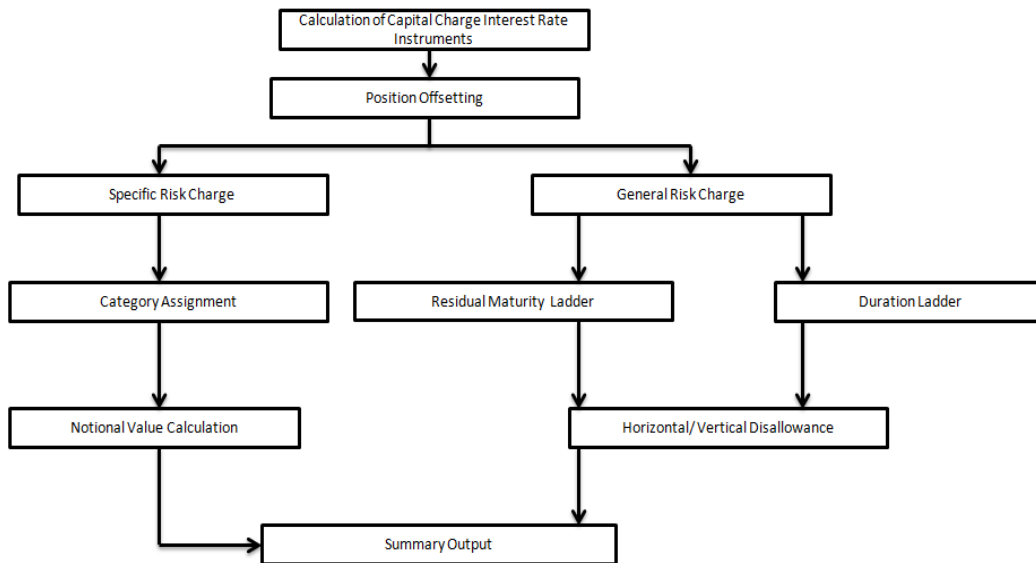
above instrument type which will be used for position conversion under data population block as detailed above. For the above FRA example, two positions will be created one long position with a maturity of 3 months and a short position for the life of the contract i.e. with a maturity of 6 months.

Second, both the position legs are reclassified into zero specific risk security.

Third, the various contract parameters are assigned by the application to both the legs. Example: Coupon Rate, Maturity,

Fourth, the Notional Value of both the legs is calculated as per the logic stated in the example.

- **Interest Rate risk Related Risk Charge:** The total risk charge for Interest Rate (IR) instruments are comprised of specific risk charge (Specific to the Issuer and Instrument) and General Risk Charge (Market related risk vested in the instrument). Process flow diagram for Interest Rate Risk



Position Offsetting:

**Specific Risk Charge:** Specific Risk charge is calculated based on Categories and Investment grade. The application first identifies the categories based on the conditions laid by the accord. Once the category is identified the specific charge weight gets assigned based on category, Basel equivalent rating and residual maturity.

**Category Assignment:** The application identifies the categories based on issuer of the instruments as Sovereign, Corporate, Banks, and so on. To identify qualifying category the application does a count of number of Basel equivalent issuer ratings present for each instrument. If the count is two or more it is a qualifying category otherwise it is an others category. For multiple Basel equivalent issuers rating available, the application does a multiple assessment and figures out the final rating on which the specific risk charge needs to be assigned. Multiple Assessments logic is based on Basel Para 96, 97, and 98 of revised framework on capital adequacy published on June 2006. Offsetting of position for specific risk charge is done only in cases where positions are identical and related to the same issuer.

**General Risk Charge:** General Risk charge is calculated for each interest rate risk exposure for a reporting bank. General Risk charge is calculated based on two methods:

- Residual Maturity Ladder Approach
- Modified Duration Ladder Approach



Under both the methods, the application creates time bands and based on residual maturity or 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 Basel II guidelines for market risk.

- Residual Maturity Ladder Approach: Under Residual Maturity ladder the general risk charge is calculated for each currency. For multiple currencies the horizontal and vertical disallowance calculation is done by creating separate residual maturity ladder for each currency unless the interest rate risk exposures are insignificant for the reporting bank. In 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 first creates around 15 residual maturity time bands. The time bands definitions are given in the Basel II guidelines based on 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.

The entire end to end processing of general risk charge calculation is done in a separate table meant only for it and can be pulled out and analyzed in the form of reports. All the processing steps and related data are stored in the table starting from time bands assignment, zone identification, thereafter the matched and unmatched position following horizontal and vertical disallowance and net open position by each currency.

- Modified Duration Ladder Approach: Under Modified Duration Ladder approach, the application creates duration ladder based on modified duration calculated for each instrument. Similar, to residual maturity ladder the general risk charge under modified 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 given by 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.

All the processing attributes used under modified duration ladder approached is stored in a separate table starting from modified duration, assumed rate change applied, time band assigned and zonal horizontal and vertical disallowance output by each currency.

**Horizontal/Vertical Disallowance:** The application does horizontal or vertical disallowance first netting opposite position within each time band and then across time bands for the carry over position. In Maturity ladder approach, each instrument position within the time band is weighted with the general risk weight and summed as aggregate long and aggregate short position for each time band. The post offset amount for each long and short position is multiplied by its modified duration and the assumed rate change to get the post offset weighted long and weighted short position under duration ladder approach. The application does a vertical disallowance by offsetting the weighted long and short position in each time-band, resulting in a single short or long position for each band and carrying over the open position for offsetting across time bands and then across three zones.

The residual net portion in each zone are then carried over and offset against opposite portions in other zones.

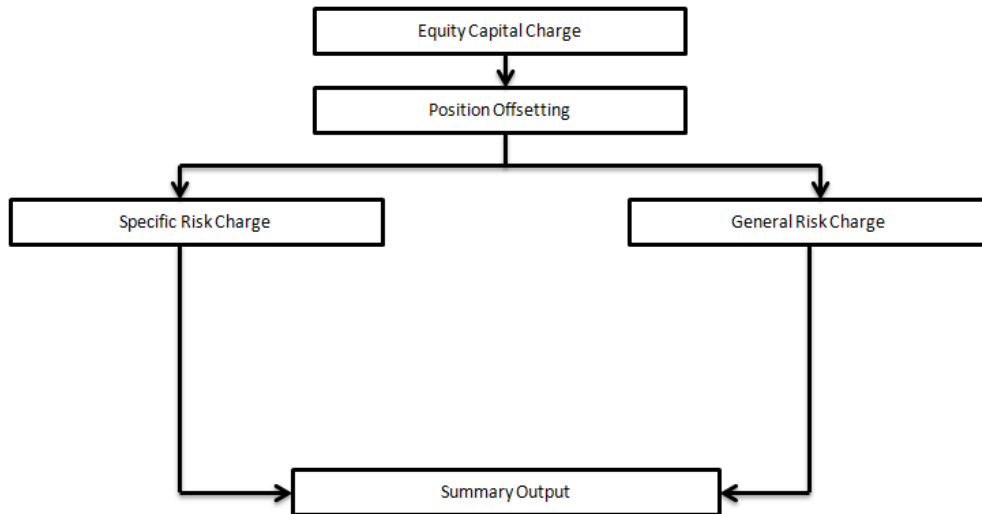
The net open portions left after matching non adjacent zones are carried over as net positions.

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.

**Summary Output:** For reporting purposes, the application moves data from market risk capital table to market risk reporting table.

At the end, Risk Weight Asset is calculated in Market Risk summary table by multiplying capital charge with 12.5. The interest risk charge gets reported out of 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.

- **Equity Risk Charge:** The application calculates equity capital charge as summation of Specific Risk charge and General Risk charge. The process flow for calculation of Equity Risk Charge is as follows:



**Position Offset:** Long and short position in the same equity instrument are offset for the matched position and net open position is carried forward as net long or net short position for specific and general risk charge calculation.

**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 case of equity derivative, the application takes into account either any future related arbitrage or deliberate arbitrage strategy created on equity. In case equity arbitrage is created out of futures, the application takes the arbitrage information as a mapping in equity arbitrage 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.

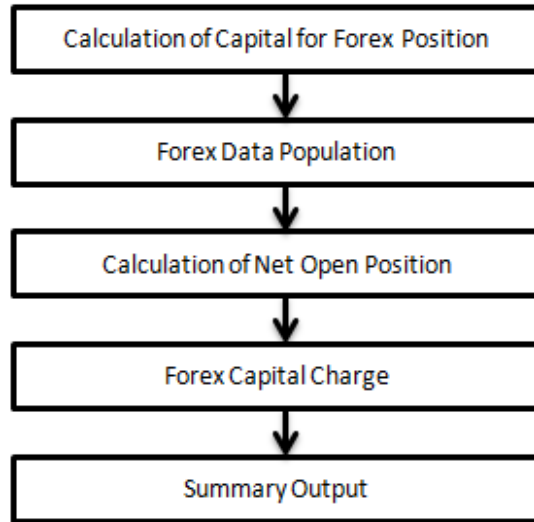
In case of deliberate arbitrage position in equity, 90% or more of matched position between index and equity gets a 4% capital charge. For the slippage of 10% or less, equity weightage in the basket is calculated as particular equity position amount out of total equity amount and then compared with equity weight age as part of index for value less than equal to 10%. The 10% value is identified as a slippage and an amount lower of equity or index is carried forward as net open long or open short position and a 8% specific risk charge is applied.

In case of depository receipts with opposite position in underlying identical equities, the mapping is expected in a depository receipts and issue mapping table where the depository receipts are mapped against the underlying equity with a conversion factor to take care of the conversion amount for offsetting. The matched opposite position in underlying equity are offset and the net open position are carried forward for an equity specific and general risk charge.

**General risk charge:** The application applies 8% general risk charge for equity instrument type.

**Summary Output:** The Equity risk charge gets reported out of market risk summary table under equity charge reporting line. Specific and general risk for equity is also reported separately from the summary table.

- **Forex Risk Charge:** The process flow for Forex capital charge is as follows:



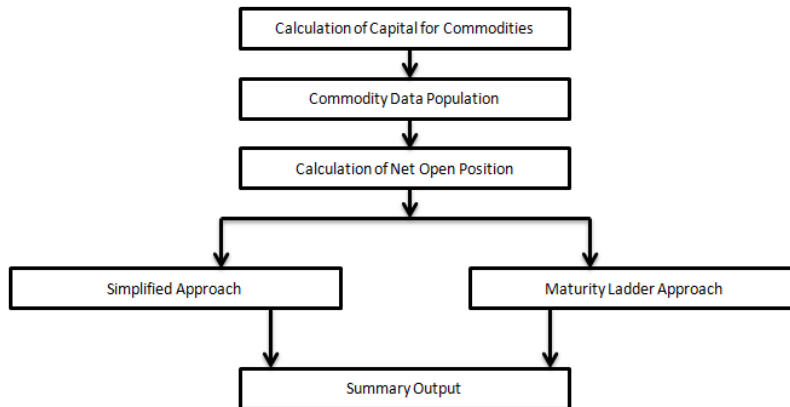
**Forex Data population:** All foreign exchange exposure data is expected at a net level by each currency in a separate table meant only for forex exposures data. Forward currency position, asset, liability, accrued interest, profit and loss, structural position, etc in different currencies are captured separately in the forex exposure table.

**Calculation Net Open Position:** The net open position is the maximum value of the net long and net short position across all currency exposures plus the value of gold.

**Forex Capital charge:** The application applies the short hand method for forex risk charge calculation by treating all the currencies to be same and applying 8% risk charge on net open position.

**Summary Output:** The forex risk charge gets reported out of market risk summary table under forex charge reporting line.

- **Commodity Risk Charge:** The process flow is as follows:



**Commodity Data Population:** Commodity data is captured at an exposure level with commodity identifier as information. Commodity identifier is referred from the list of commodities available in the dimension table meant only for commodities.

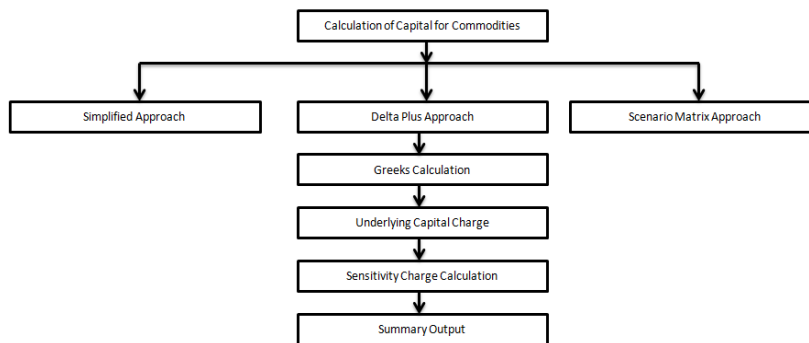
**Position Offset:** Application does a position offset for commodities based on common commodity group identifier. The net long and short position is carried forward for commodity risk charge application. In case of any derivative position taken on commodity, the capital charge is calculated based on position conversion to capture both option or interest rate risk charge if existing and a capital charge for the commodity

**Simplified Approach:** In case of simple approach, application moves date from market risk exposure table to market risk commodity capital table. In Simplified approach, application calculates 15% capital charge on the net open long or open short position plus an additional 3% capital charge on gross position (long plus short) for each commodity group.

**Maturity Ladder Approach:** In maturity ladder approach, Application creates 7 maturity ladders as per the definition given in Basel II guidelines for Market Risk. The offsetting is done within each time band and for the matched position 1.5% capital charge is applied and the net open position of each time band is carried forward and a capital charge of .06% is applied to all the carried forward amounts. For the final net open position post offset across the time bands a capital charge of 15% is applied

**Summary Output:** The commodity risk charge gets reported out of market risk summary table under commodity charge reporting line.

- **Options Risk Charge:**



**Simplified Approach:** In simplified approach for option type being long cash and long put or short cash and long call, application calculates in the money values for the option. In case of in the money option the value is calculated as the number of units multiplied by the difference of underlying forward price and strike price if the residual maturity of the option is greater than 6 months. In case of the residual maturity of the option contract being less than or equal to 6 months the in the money value is calculated as number of units multiplied by the difference of underlying current market price and strike price.

The capital charge is arrived as the difference between sum of general risk and specific risk on the underlying value and in the money value of the option. For long put or long call application applies the capital charge as least of sum of general risk and specific risk on the underlying and option premium value.

**Delta Plus Approach:** In delta plus approach the option taken on any underlying contract goes for position conversion. The position conversion is detailed in the position conversion block. The purpose of position conversion is to create multiple positions with delta weighted amounts and send each position for respective capital charge calculation.

**Greeks Calculation:** Application calculates Greeks for options based on the option contract information. The Greek calculation involves calculating implied volatility, delta, gamma and vega. The information required for calculating Greek is explained under “**Position Conversion Parameter Assignment**”. Each of the Greek calculated then participates in sensitivity charge calculation.

**Underlying Capital Charge:** For options contract in equities, commodities, gold, currencies, etc. one leg goes into interest risk calculation and the underlying leg goes into the respective asset (i.e. equity, forex, commodity, etc.) charge calculation as the case may be.

**Sensitivity Charge Calculation:** For options, total charge includes underlying capital; charge plus sensitivity risk charge. Sensitivity risk charge includes delta risk, gamma risk, and vega risk charge. The formula used against each of the sensitivity charge is as per Basel II guidelines on Market risk.

**Summary Output:** The capital charge for option is reported from summary table where reporting line is options where as the underlying risk charge gets reported under the respective reporting line.

**Scenario Matrix Approach:** Currently the application does not cater to scenario matrix approach for option contracts.

### Key Data Elements

A few key data elements are listed in this section. For a complete list of tables and columns to be populated Download Specification document.

For Staging Data Population the key data elements involved are as follows:

- Interest Rate Historical Data: Interest Rate information for IR instrument is stored here.
- Bank Positions: Price of Instrument and No of Units for OTC instruments are stored here.
- Market Instrument Contract: Price of Non-OTC instruments is stored here.

For Market Risk Processing the key data elements involved are as follows:

- Instrument contract: Instrument Type, Counter party type, currency code, coupon rate, effective date, maturity date, strike price, coupon rate, coupon frequency are stored here.
- Forex Exposures: Exposure amount, asset amount, asset accrued interest, asset accrued profit are stored here.
- Instrument Position Mapping: This table is seeded data where instrument type, its position like 'SHORT' or 'LONG', its position conversion code like 'LONG' or 'SHORT' is stored. This is required in case of position conversion of instruments.

### *Internal Model Method*

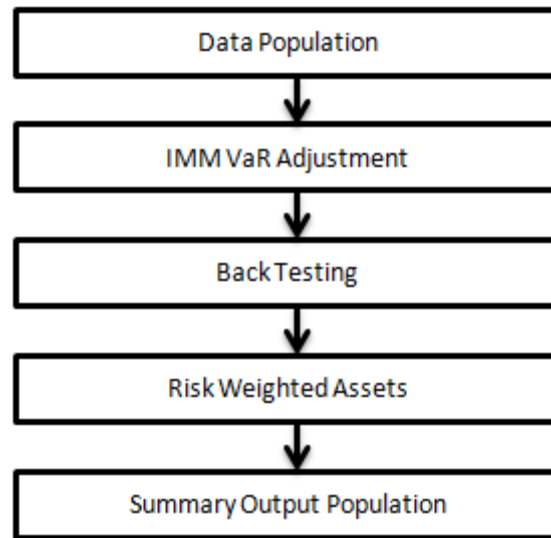
#### Overview

As per internal models approach for VaR calculation Banks has to provide for capital requirement which is higher of

- Previous Day VaR
- Average of previous 60 days VaR multiplied by a factor

Bank also needs to calculate stress VaR modeling movement of risk factor due to extreme scenarios. Total Capital requirement is a summation of normal VaR plus stress VaR.

## Process Flow



- **Data Population:** First the application populates VaR data from stage market risk VaR data to fact market risk VaR data. The application expects VaR, stress VaR, Hypothetical and Actual Profit and Loss data as input from bank at a portfolio level.
- **IMM VaR Adjustment:** The application takes the maximum of previous day VaR and 60 day average VaR which comes input and apply a factor of 3 to arrive at a final VaR number. Similar approach is followed for stress VaR and then normal VaR and stress VaR are added up for final capital requirement under market risk IMA.
- **Back Testing:** The application does a back testing of VaR number by comparing the total VaR with hypothetical an actual profit and loss. In case the VaR breaches the hypothetical an actual profit and loss solution updates each breach as an exception.
- **Risk Weighted Assets:** VaR number is changed to RWA by multiplying an inverse of 12.5.
- **Summary Output Population:** The reporting of VaR numbers happens out of fact market risk summary under respective reporting line item.

## Operational Risk

### Overview

Operational Risk (OR) is an adverse outcome resulting from internal events or external events. Adverse impact due to internal events can arise from inadequate or failed internal processes, people, or systems. External losses can occur due to theft of information or hacking of systems. The Basel II accord has prescribed three methods for calculating OR capital charges and banks can use any of these methods to calculate capital charge:

- Basic Indicator Approach
- Standardized Approach
- Alternative Standardized Approach

---

**NOTE:** While executing Solo Run for computing Operational Risk the parent entity data is processed. However, for a Consolidation Run the Parent entity as well as the subsidiary data is processed.

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### Basic Indicator Approach

To calculate the Capital Charge under the Basic Indicator Approach (BIA), the annual gross income for each of the past three years for a standard line of business is multiplied by a fixed percentage of 15%. Then the average is considered to calculate the capital charge. If the annual gross income is negative or zero in any of the past three years, then the value from the numerator is excluded thereby reducing the base denominator by the same count.

The Capital Charge formula is as follows:

$$K_{BIA} = \left[ \sum (GI_{1..n} \times \alpha) \right] / n$$

### Standardized Approach

In this approach, banking activities are divided into eight lines of business. The Gross Income for each line of business is multiplied by the beta factor which is pre-defined in the Basel II Accord. Every year the gross income of the standard line of business is multiplied by respective beta factor. The total capital charge is calculated as the three-year average of the sum of the regulatory capital charges across each lines of business every year. The total Capital Charge is calculated as follows:

$$K_{TSA} = \left\{ \sum_{\text{years } 1-3} \max \left[ \sum (GI_{1-8} \times \beta_{1-8}), 0 \right] \right\} / 3$$

#### Where

**K<sub>TSA</sub>** = the Capital Charge under the Standardized Approach

**GI<sub>1-8</sub>** = annual gross income in a given year (as defined in the Basic Indicator Approach) for each of the eight lines of business.

**β<sub>1-8</sub>** = a fixed percentage, set by the committee, relating the level of required capital to the level of the gross income for each of the eight lines of business.

### 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. The beta factor as in the Standardized Approach remains the same for Retail and Commercial Banking. The constant factor “m” is equal to 0.035. The capital charge for Retail and Commercial Banking uses the Loan and Advance Amount and for all the others the calculation of capital charge is the same as in the Standardized Approach. The total capital charge is calculated as the three-year average of the sum of the regulatory capital charges across each lines of business every year.

### Process Flow

#### Prerequisite

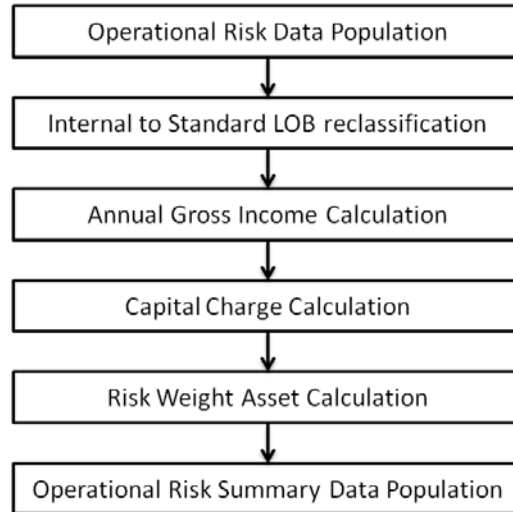
Before calculating the capital charge for Operational Risk, the following should be computed as a prerequisite:

In the processes **OPS\_RISK\_STD\_APPROACH**, **OPS\_RISK\_BASIC\_IND\_APPROACH**, and **OPS\_RISK\_ALTERNATE\_STD\_APPROACH** the task defined as **OR\_Capital\_Std\_App**, **Opr\_Risk\_Capital\_Charge**, and **OR\_Capital\_Std\_App** respectively, should mention the number of years

(in the past) as a parameter for capital calculation.

For example: if the previous 3 years are considered, then assign 3 as a parameter against the task **OR\_Capital\_Std\_App**. Therefore, in the future if the previous 4 years have to be considered then change that particular parameter only.

After defining the parameter the procedure to compute Operational Risk is as follows:



- **Operational Risk Data Population:** The input data for each of the financial years mapped along with the Internal Line of business are populated in the processing table.
- **Internal LOB to Standard LOB Reclassification:** The internal lines of business are reclassified into Basel standard lines of business.
- **Annual Gross Income Calculation:** For each of the standard line of business, for each financial year the Annual Gross Income is calculated.
- **Capital Charge Calculation:** Capital Charge is calculated by multiplying the alpha value or the beta value (for Basic Indicator Approach or Standardized Approach) with the annual income of each year across each standard line of business. Then the average of 3 years is considered (If the values of all the 3 years are positive). If the values of all the 3 years are not positive then exclude zero or the negative value from both numerator and denominator.
- **Risk-Weight Asset Calculation:** The Capital Charge value obtained is then converted to equivalent Risk-Weighted Asset value by multiplying with the factor 12.5.
- **Operational Risk Summary Data Population:** The RWA amount is populated into OR summary table along with the entity for which the OR RWA is calculated. The application converts all the elements in Annual Gross Income and Loan and Advance amount reported in their respective national currency to the reporting currency. While calculating Annual Gross Income or Loan and Advance amount for the subsidiary that are part of regulatory consolidation, the amount is limited to the share-holding percentage. Hence, a subsidiary which is part of regulatory consolidation and parent holding in the subsidiary is say 45%, the amount limited to 45% is considered for gross calculation. Similarly, if the holding is more than 50%, the entire amount is considered for gross calculation.

### **Key Data Elements**

A few key data elements need to be noted while calculating the Capital Charge for OR for the consolidated entity. To view the complete list of tables used for CCR computation refer to the *Download Specification* document.



- Entity details which are part of regulatory consolidation and parent entity share holding percent is required.
- 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.

## 4.1.2 Capital Structure

### Overview

Basel II capital structure calculates the total capital of the Bank Holding Company. The total capital consists of the following components:

- Tier 1 Capital
- Tier 2 capital
- Tier 3 Capital

Tier 1 Capital consists of core equity capital, retained earnings, and disclosed reserves. Tier 2 capital consists of undisclosed reserves, revaluation reserves (discounted by 55%), general provisions, hybrid debt capital and subordinate term debt. Tier 3 consists of short term subordinate debt covering market risk instrument.

The total capital amount arrived for each tier of Capital is followed by deduction of Goodwill, Investment in the subsidiary engaged in BFSI, Reciprocal Cross Holding, and expected loss greater than Total Provision amount. These line items are deducted 50% from Tier 1 capital and 50% from Tier 2 capital. Securitization transaction and DTA are deducted from Tier 1 Capital.

Tier 2 capital is limited to 100% of Tier1 capital whereas Tier 3 capital is limited to 250% of Bank's Tier1 capital. The total capital ratio must be no lower than 8%.

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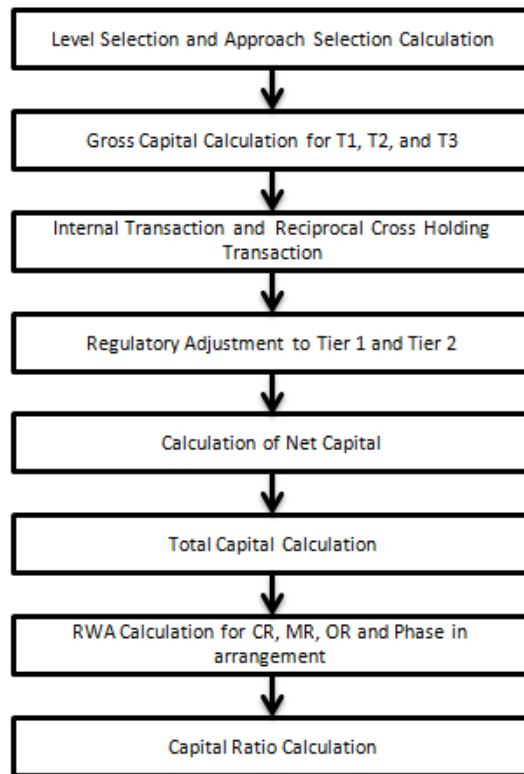
**NOTE:** While executing Solo Run the parent entity data is processed. Investment into the subsidiary data undergo RWA calculation as per credit risk and market risk rule. Capital line item pertaining to parent entity is only processed. For Consolidation approach, the Parent entity as well as the subsidiary data is considered. All the GL line items are expected at Solo level for each entity. The consolidated data is discarded.

---

### Assumption

The GL codes are expected to be unique across entities in **STG\_GL\_DATA** and **DIM\_CAPITAL\_ACCT\_HEAD**.

### Process Flow



- Level Selection and Approach Selection Calculation:** To process the Capital for a Banking Organization, the organization level at which the capital has to be calculated and also whether to execute Solo Run or Consolidation Run must be defined. If Solo is selected, only for that particular selected banking organization the capital is calculated, and if Consolidation is selected all the entities that fall under the umbrella of the selected organization is part of Capital calculation. This is done in task – ‘Capital Consolidation Level Selection’ in process ‘**CAPITAL\_CONSOLIDATION**’

Based on the share-holding percentage of the Parent Bank in the subsidiary, and the consolidation approach to be followed (Consolidation Approach, Deduction Approach, and Deduction Approach) for each of the entity, the Basel approach is selected. For example: if the share-holding for an entity is 35% and part of consolidation process, the approach selected for this entity is pro-rata consolidation. The above reclassification is done in task – ‘Cap Consl Basel Approach Type Reclassification for an Entity’ in process ‘**CAPITAL\_CONSOLIDATION**’

- Gross Capital Calculation for T1, T2, and T3:** The total gross capital for each Tier of capital that is, T1, T2, and T3 are calculated as per the definition of T1, T2, and T3 by adding the relevant financial instrument in each tier of Capital. The above calculation is done in sub process – ‘Capital Components Calculations’ in process ‘**CAP\_STRUCT**’.
- Internal Transaction and Reciprocal Cross Holding Transaction:** All inter-group and reciprocal-cross holding capital investments are marked as internal customer transaction and reciprocal cross holding respectively. The marking is done by populating appropriate standard account head surrogate key for the exposures which qualifies as internal transaction or reciprocal cross holding.
- Regulatory Adjustment from Tier 1 and Tier 2:** All the regulatory adjustment line items are identified and 50% of the total amount is deducted from Tier 1 capital and 50% from Tier2 Capital. In order to handle this 50-50 deduction all the regulatory adjustment line items are moved to table

**FCT\_CALC\_ACCT\_HEAD** where each of the regulatory adjustment line items are equally split into 2 records, with one Capital Component group of one record marked as 'T1COMP' and other record as 'T2COMP'. The above processing is done in sub processes – **Calc Acct Head Population** and **Std Acct Head Population** in the process CAP\_STRUCT.

- **Calculation of Net Capital:** Net Tier 1 Capital is calculated by deducting the Securitization transaction, DTA and 50% of regulatory adjustment line item. Similarly Net Tier 2 is calculated by deducting 50% of regulatory adjustment line item. If Net Tier 2 is greater than Net Tier 1 capital, than Net Tier 2 is limited to Net Tier 1 capital.
- **Total Capital Calculation:** Sum the total Net Tier 1 capital, Net Tier 2 capital and Net Tier 3 capital to obtain the Total Eligible Capital.
- **Risk Weighted Asset (RWA) Amount – Credit Risk, Market Risk and Operational Risk:** The RWA amount for Non Securitization, Securitization, Market Risk, and Operational Risk are calculated by summing up the RWA amount is reported under different headings as 'Risk Weighted Asset amount for Standardized Portfolios for Non-Sec, "Sec Std RWA" for Sec portfolio, "Market Risk RWA" for Market Risk and "Operational RWA" for Operational Risk.
- **Capital Ratio Calculation:** T1 ratio and Capital Adequacy ratio are calculated using the Total RWA amount and Net T1 Capital, and Total Capital amount. The above processing is done in sub process – **Capital Components Calculations** in the process CAP\_STRUCT.

## Key Data Elements

A few 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 refer to the Download Specifications document:

- Entity details which are part of regulatory consolidation, and parent entity share holding percent.
- The capital structure component for each tier of capital for all entities involve in regulatory consolidation.
- The General Ledger line items are captured as download in Stage General Ledger Data (STG\_GL\_DATA).
- If and capital Line item like 'MR RWA' or 'OR RWA' is available as download, then these Non GL line items are expected as download in Stage Standard Accounting Head (STG\_STANDARD\_ACCT\_HEAD).
- The standard account head id of line items like 'Net Tier 1 Capital', 'Capital ratio', etc which are computed by application are expected to be mapped to Capital Account Identifier – 'OTHERS'. So that the application populates these line items into Fact Standard Accounting Head (FCT\_STANDARD\_ACCT\_HEAD) with initial value as 0. Later this value will be over written by application.
- Information stored in FSI\_CAPITAL\_STANDARD\_MAPPING is a mapping of GL capital line items with seeded data in DIM\_STD\_ACCT\_HEAD. For all jurisdictions this mapping needs to be present.



FSI\_Capital\_Standar  
d\_Mapping\_Basic.xls.

### 4.1.3 Capital Consolidation

Capital Consolidation Level Selection:

The reporting bank may be a part of a financial group that has multiple legal entities like parent or child entities (subsidiaries) under its name. The entity for which processing is to happen has to be selected by you. You also have to select whether a 'Solo' or 'Consolidation' execution is to be done. You can select these options using the run execution screen, but if the execution is executed using RRF execution then these options have to setup using the rule 'Capital Consolidation Level Selection' in the process 'CAPITAL\_CONSOLIDATION'

CAPITAL\_CONSOLIDATION is the first process to be added in all the runs defined through Run Rule Framework except the ones for staging data population. Run Management screen selects this process by default.

Run Parameters Assignment:

Basel Accord mentions about different approaches for calculating RWA. Run management framework in the product allows the reporting bank to define and execute a Run by selecting a combination of different Basel II approaches for RWA computation.

Run parameter Assignment is also part of Capital Consolidation process. The rule 'Run Definition User Defined Run Param Assignment' is used to assign the run parameters in case of a run executed through Run Rule Framework. But if the execution is through run management, the parameters are populated based on the run defined in the run definition screen.

## **Approaches Followed in Capital Consolidation**

The three approaches followed by the Capital Consolidation are:

Consolidation Approach(CONSL): Under this approach, all the entities of the bank's organizational structure are considered. This includes all the entities/subsidiaries that belong to the same jurisdiction. All the exposures of the entities in the organizational structure are considered for computing risk weighted exposures, except the intra-group exposures.

Aggregation Approach(AGG): This approach is similar to the Consolidation approach but is used in the cases, where some of the entities that are part of bank's organizational structure belong to a different jurisdiction. The capital requirement of the affiliate is computed as per the jurisdiction that it is subject to and is then aggregated with the rest of the group's capital requirement. Intra-group exposures are not excluded in this approach.

Deduction Approach(DED): This approach is used in the case where some of the subsidiaries/entities that are part of bank's organizational structure are excluded from consolidation. In such a scenario, the regulatory investment in the excluded subsidiary attributable to the rest of the group are deducted from the consolidated capital requirements.

## **4.2 Basel III**

For the current OFS Basel Basic approach 6.0.0.0.0 release Basel III related changes have been incorporated for the BIS segments only.

### **4.2.1 Changes in BIS Segment**

The Capital Consolidation approach in the previous releases of the Basel Application was compliant with Basel II guidelines. With this release, this has been modified to be compliant with Basel III guidelines issued by Basel Committee. You also have the option of selecting any one of the Basel II or Basel III processes. As per the Basel III guidelines, the following changes have been incorporated in the BIS segment:

- Credit Risk Mitigation process for non securitized exposures (there are no changes in the computation of Credit Risk for securitized exposures)
- Capital Structure
- Capital Buffers

- Leverage Ratio
- Credit Valuation Adjustment

## Credit Risk for Non Securitized Exposures

The application supports the computation of Credit Risk RWA as per the guidelines laid out in the Basel Accord. Credit Risk RWA computation is broken down to Credit Risk for Non Securitized Exposures and Credit Risk for Securitized Exposures. For Credit Risk for Non Securitized Exposures, the application follows Standardized Approach.

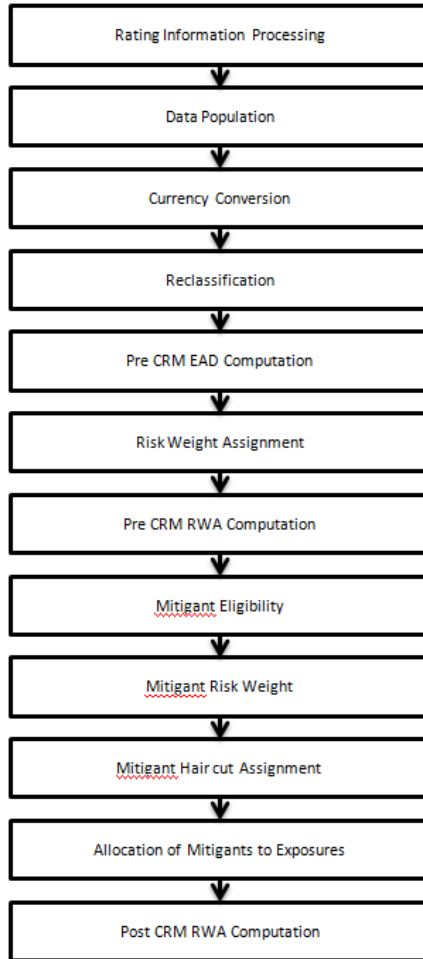
### *Standardized Approach*

All the credit risk exposures are identified by their product types, counterparty types and their corresponding asset classes by the application. A sample list of Products Types, Party Types, Mitigant Type, credit ratings are pre-defined in the Basel Application. However, this list and naming convention differs from one bank to another. Hence, the application reclassifies the bank's data into standard data as per the Basel accord. The application reclassifies the bank's product types and party types to Basel standard product and party types. Based on these standard Basel product and party types, an asset class for each exposure is formed. For equity exposures, the asset class is formed on the basis of equity type and Basel product type. The application does further data processing based on these standard reclassifications. In the current release, some new product types have been added in the list and the application is updated to reclassify them to new Basel standard product types.

Some exposures may be hedged against credit risk through various mitigants like guarantors, collaterals, credit derivatives, and so on. These provide certain mitigation to credit risk and should be considered while computing Credit Risk RWA as per Basel norms. Hence, the application calculates both pre-mitigation exposure amount and post-mitigation exposure amount.

The Basel committee has revised Credit Risk Mitigation (CRM) guidelines to a large extent and the same have been incorporated in the application. The changes at a macro level relate to the recognition of the eligible mitigants, applicable for both the Securitized as well as the Non-Securitized exposures. BCBS has also revised the haircuts to be applied for the debt securities issued by a securitization transaction which act as collateral. The remaining processing for CRM remains the same as per the previous releases of the Basel application. Based on the asset class, the application calculates the pre CRM EAD for each exposure. This value signifies the maximum loss that the bank may undergo in case of default on this exposure, prior to considering any mitigation effects. Through 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 may undergo in case of default on this exposure, after considering all the 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 in this case is arrived at by analyzing the credit rating of the exposures or mitigants as per the Basel guidelines. Some credit risk exposures that fall under the category of internal transactions like holding own subsidiaries shares or investment in its capital, reciprocal cross holding, and so on, are treated separately under capital structure.

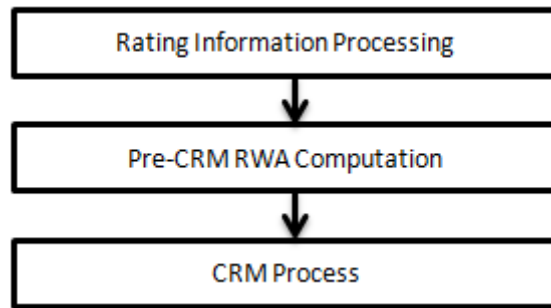


The processing of only mitigants eligibility is different in this current release whereas processing of all other line items remains the same.

### Mitigant Eligibility and Haircut Assignment

#### Overview

As per the Basel III guidelines, BCBS recognizes the need to change certain criteria in the eligibility of mitigants due to the economic crisis of 2008. It has revised the criteria for recognition of the eligible mitigants, applicable for both the Securitized as well as the Non-Securitized exposures. BCBS also revised the haircuts to be applied for the debt securities issued by a securitization transaction which act as collateral. These changes are an outcome of the financial crisis of 2008, because these transactions are very much sensitive to the price changes. This is applicable in the case of Standardized Approach.

Process Flow

The process flow for the CRM is the same as what is existent in the application for Basel II except for few differences. The differences are in the Mitigant Eligibility and the Mitigant Haircut Assignment. The Mitigant Eligibility depends on the original ratings in the case of Securitized exposures. Hence this has an effect on the credit rating processing.

- **Rating Information Processing:** All the rating information of the mitigants are populated from the staging tables to the processing tables. The mitigants rating information are captured in the instrument rating details. The flag Y in the **F\_ORIG\_CREDIT\_RATING\_IND** indicates that the rating is the original rating or the rating of the instrument at the time the protection was given and N indicates that the rating is the current rating.

This is handled in the **CREDIT\_RATING\_PROCESSING** process.

Also, multiple assessment is performed for the mitigants current rating as well as the original rating. This is handled along with the multiple assessment of the exposures.

- **Pre-CRM RWA Computation:** The application computes the Pre-CRM RWA based on the approach selected – standardized.
- **CRM Process:** The Mitigant Eligibility, Mitigant Risk Weight, Haircut Assignment and Allocation of Mitigants to Exposures are handled in CRM sub-process. The mitigant eligibility and the haircut assignment are the tasks which are different from the Basel II tasks.

**Mitigant Eligibility:** The application identifies the eligible mitigants based on the criteria as mentioned by the Basel Accord. The application identifies the following mitigants– Collateral, Guarantees, and Credit Derivatives. The application is capable of using the Simple Approach as well as 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 type, the credit rating assigned to the mitigant or the party (as applicable) and whether the collateral is classified as a senior or not. In the case of equity, the eligibility is based on the main index equity and the equity trading status. In the case of Mutual funds, the eligibility is based on the eligible mutual fund indicator.

The application also identifies whether the mitigant is a resecuritized exposure and if yes, makes it ineligible. 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 based on the satisfaction of the criteria as specified in the Basel Accord. All the guarantees and credit derivative issued by Issuers who are reclassified as Other Entities will be treated as eligible for Non-Securitization exposures if they have any rating assigned to them. All the guarantees and credit derivative issued by Issuers who are reclassified as Other Entities will be treated as eligible for Securitization exposures if they satisfy the current rating and the original rating criteria specified by the Basel Accord.

**Haircut Assignment:** The application assigns the various haircuts, as applicable to the Mitigants. In the case of collateral following simple approach for recognition, there will be no haircuts assigned to the Mitigant. In the case of collateral following Comprehensive approach, the application is flexible to use the Supervisory haircuts,

and scale up if required based on the minimum holding period or use the Bank's own estimate of haircuts. The application applies the Volatility haircut, forex haircut and the maturity mismatch haircut to the mitigants as appropriate. This is as per the Basel Accord regulations. The volatility haircuts for debt securities which are mitigants have been modified to include the securitized exposures.

Only eligible mitigants are considered for haircut assignment and for further processing. The eligible mitigants are moved from mitigants table to sub exposures table.

The CRM change is applied in the following processes:

- BASELIII\_NON\_SEC\_STD
- BASELIII\_SEC\_STD

This is applicable in the case of Basel III Standardized Approach. This change has an impact for both the Securitized Exposures and the Non-Securitized exposures.

### Key Data Elements

A few key data elements are listed in this section. For a complete list of tables and columns to be updated refer to the Download Specifications document.

#### *For Mitigants*

- Resecuritized exposures Mitigant – The mitigants belonging to resecuritized exposures will have “Y” value in this field. The application will mark them as ineligible mitigants.
- Securitized exposures Mitigant – The mitigants belonging to resecuritized exposures will have “Y” value in this field. The application will assign different volatility haircuts for these, depending on the current ratings and the residual maturity.

#### *For Ratings*

- Current Rating for the Guarantees and Credit derivatives issued to Non-Securitized Exposures.

Current Rating and Original Rating for the Guarantees and Credit derivatives issued to Securitized Exposures.

## **Standardized Approach for Counterparty Credit Risk**

### ***Overview***

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 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.

***Important:*** The changes detailed in this section will be applicable only from 1 Jan 2017. Therefore, only those Runs with the FIC\_MIS\_DATE greater than or equal to 1 January 2017, will be executed.

According to the guidelines, the banks that do not have approval to apply the IMM approach for the relevant OTC transactions, must use SA-CCR.

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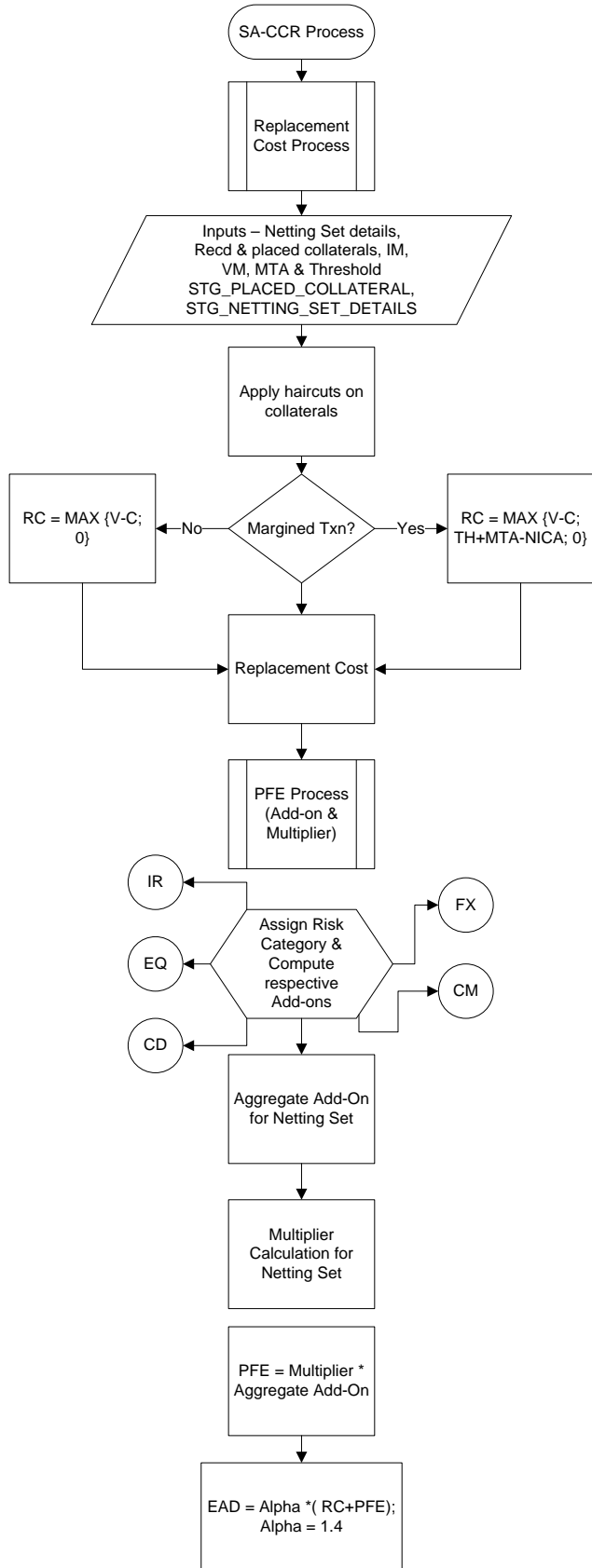
**NOTE:** This approach does not impact the IMM approach for CCR and any processes for IRB (AIRB or FIRB) runs.

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### ***Process Flow***

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





## **Replacement Cost**

The Replacement Cost (RC) is computed differently for margined and unmargined netting agreements. The Exposure at Default (EAD) for margined netting agreement is capped at the EAD of the same netting agreement calculated on unmargined basis.

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**Note:** The RC has been capped to zero to ensure that the replacement cost does not become negative value when the bank maintains NICA in excess of TH+MTA.

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For unmargined transactions, the RC intends to capture the loss that occurs when a counterparty defaults and closes out its transactions immediately. For margined transactions, the RC intends to capture the loss that occurs if a counterparty defaults at present or on the future, assuming that the closeout and replacement of transactions occur instantaneously. However, there may be a period (the margin period of risk) between the last exchange of collateral before default and replacement of the trades in the market.

The RC can be calculated as follows:

For unmargined transactions:

$$\mathbf{RC = MAX \{V-C; 0\}}$$

Where V = Value of the derivative contract in netting set

C = Haircut value of net collateral held.

For unmargined transactions:

$$\mathbf{RC = MAX \{V-C; TH+MTA-NICA; 0\}}$$

Where, V = Value of the derivative contract in netting set

C = Haircut value of net collateral held

TH = Positive threshold before counterparty sends collateral to bank

MTA = Minimum transfer amount applicable to counterparty

NICA = Net Independent Collateral Amount

The formulation for RC for SA-CCR approach depends on the transaction types (margined or unmargined). You need to distinguish between the transactions that require only Initial Margin (IM) and no variation margin (VM) that is unmargined transactions and the transactions that require both IM and VM that is margined transactions.

The following tables are referred to as derivative tables in the application. Note that the data for counterparty credit risk related transactions that is for derivatives, are expected in these tables:

- STG\_FUTURES
- STG\_OPTION\_CONTRACTS
- STG\_SWAPS\_CONTRACTS
- STG\_CREDIT\_DERIVATIVES.

The N\_MARKET\_VALUE column in all the preceding derivative tables is used to store the market value of the derivative contract.

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**NOTE:** Due to uncertainty in the guidelines regarding the treatment of cross-product netting agreements (the nettings agreements that include both OTC and SFT), the application calculates the netting agreement level amounts applicable for OTC derivatives by finding out the proportion of OTC in the netting agreement and then allocating the contract amounts accordingly to the same under SA-CCR approach.

---

IM and VM are expected at netting agreement level. Banks need to provide the same either by dividing the IM/VM at counterparty level into netting agreements or by aggregating the IM/VM at transaction level to the

netting agreement level. Minimum Transfer Amount and threshold amount should also be provided at netting agreement level in STG\_NET\_EXPOSURES table.

Banks are also required to identify the transactions as margined or unmargined and provide the values appropriately in the F\_MARGINED\_TXN\_IND column of the STG\_FUTURES, STG\_OPTION\_CONTRACTS, STG\_SWAPS\_CONTRACTS, and STG\_CREDIT\_DERIVATIVES tables. Bilateral transactions, where there is a one-way margining agreement exists in favor of the counterparty (where bank posts but does not receive collaterals) need to have the value of the column F\_MARGINED\_TXN\_IND as Y.

### ***Potential Future Exposure (PFE)***

The PFE, Add-ons, and Multiplier are detailed in this section.

The PFE add-ons consists of an aggregate add-on component, which consists of add-ons calculated for each risk category and a multiplier that allows for the recognition of excess collateral or negative mark-to-market value for the transactions.

Add-on Aggregate is the aggregate of add-on components. The multiplier is defined as a function of the following three inputs:

- Value of the derivative contract in netting agreement (V)
- Haircut value of net collateral held (C)
- Add-on Aggregate.

If the banks hold collateral which is present in excess than the market value of derivative contracts to reduce the counterparty credit risk, it is called, over-collateralization. If the value of the collateral is lesser than the market value of the derivatives, the contract is called, under-collateralized. To provide the benefit of over-collateralization to banks, BIS has introduced a multiplier on the PFE Add-ons. This decreases as the collateral value increases and is at five percentage of the PFE Add-on.

Therefore, when collateral value is higher than the derivative value, RC becomes zero and the PFE Add-on is multiplied by a multiplier to factor in the effect of over-collateralization. If the contract is under-collateralized, that is if the collateral value is less than the derivative value, the replacement cost remains the same as explained in the [Replacement Cost](#) section (for both margined and unmargined). In addition, the multiplier becomes equal to, one so that, under collateralization neither benefits nor detracts the bank.

Add-on Aggregate is the sum of the Add-ons for each risk category in a netting agreement. Note that it is an absolute sum and not a netting effect.

The process for Add-on calculation includes the following steps.

### **Risk Category**

For each exposure, the banks need to 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. For Add-on calculation it is assumed that all the exposures possess zero current mark-to-market value. That is, all the contracts are at-the-money. The risk categories can be identified by defining the primary risk factors of underlying exposures in the derivative contracts.

### **Adjustments**

There are multiple factors which are a part of the Add-on estimation formulae for each risk category, based on which the transactions need to be adjusted. These factors are:

- Adjusted Notional Amount: An adjusted notional amount based on actual notional or price is calculated at the trade level. For interest rate and credit derivatives, this adjusted notional amount also incorporates a supervisory measure of duration.

- **Delta Adjustment:** Supervisory delta adjustment is made to the notional amount depending on the position of the trade (long/short) and the type of trade (option, CDO tranche, or neither).
- **Volatility Adjustment:** Supervisory adjustment is applied to notional amount to capture volatility.
- **Hedging Sets:** The trades within each risk category are separated into hedging sets and an aggregation method is applied to aggregate all the trade-level inputs at the hedging set level and finally at the risk-category level. For credit, equity, and commodity derivatives, this involves the application of a supervisory correlation parameter to capture important basis risks and diversification.
- **Maturity Adjustment:** A maturity factor depending on type of transactions (MF margined, MF Unmargined) is defined based on the time horizon at trade level. This maturity adjustment factor is applied to the adjusted notional amount. Maturity adjustment for unmargined transactions is the lesser of one year and residual maturity of the contract, floored by 10 business days. For margin transactions, maturity adjustment is calculated after minimum period of risk (MPOR) which depends on cleared transaction indicator.

### Period or Date Parameters

Four date parameters are used in SA-CCR approach. These are:

- **M:** This is the latest date on which the contract is active. In such cases where the derivative contract has another underlying contract (for example, Swaption) and where the exercise of one contract may result into the position in the underlying contract, M is the final settlement date of the underlying contract. This input is used in MF adjustment for unmargined transactions.
- **S:** This is the start date for the interest rate derivatives and credit derivatives. If the derivatives refer to another underlying interest rate or credit instrument, then the start date is calculated based on the underlying contract. This value should not be less than 10 days. If the contract has already started, it should be equal to zero.

For example, for Bond futures, S is the start date of the bonds. These inputs are used for the duration adjustment of notional amount for IR and Credit derivatives.

- **E:** This is the contract end date for the interest rate derivatives and credit derivatives. If the derivatives refer to another underlying interest rate or credit instrument, then this end date is calculated based on the underlying contract. This value should not be less than 10 days.

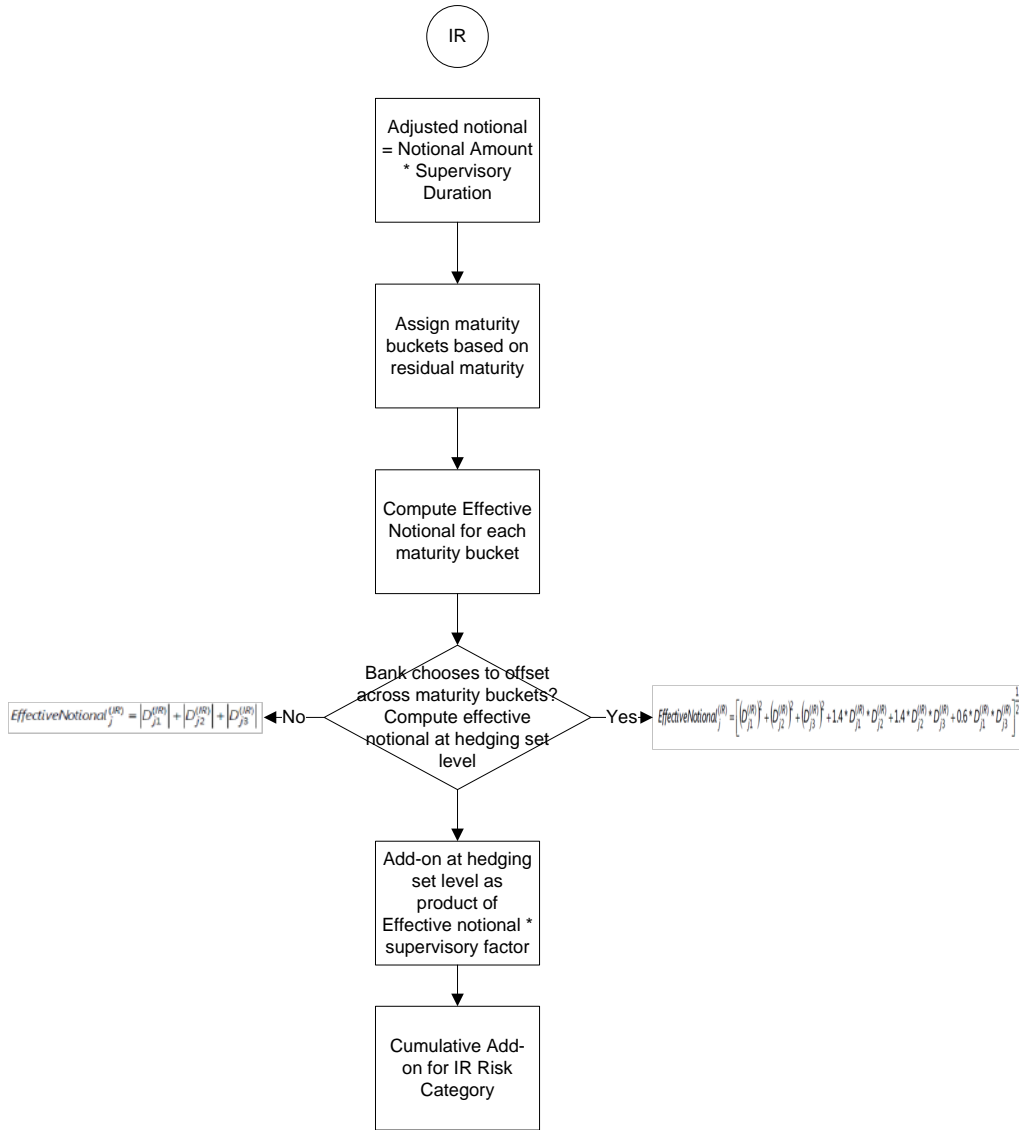
For example, for Bond futures, it is the end date of the bonds. This input is used for the duration adjustment for notional amount of IR and Credit derivatives. Also, this date determines the maturity bucket category for the IR and Credit Risk Categories.

- **T:** This is the latest contractual exercise date for options in all the Risk Categories. This is used in the computation of Delta adjustment factor for options.

### Add-ons:

#### Add-on for IR Derivatives:

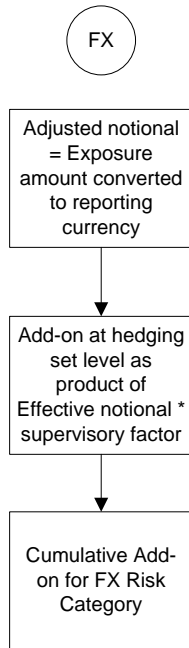
Following flowchart depicts the IR derivatives:



For interest rate derivatives, each currency forms a different hedging set. In each hedging set, the trades are divided into maturity buckets (Less than 1 year, 1 to 5 years, and more than 5 years). Positions are allowed to be completely offset within a time bucket. Add-on for IR derivatives is the sum of add-ons for each hedging set.

**Add-on for Forex Derivatives:**

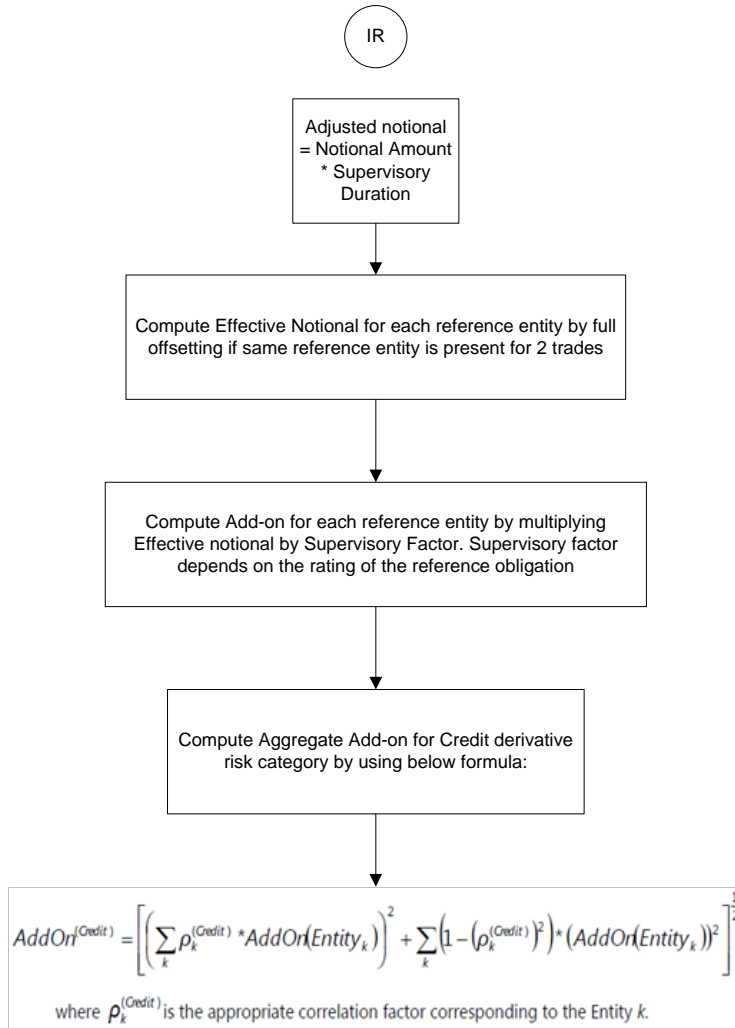
Following flowchart depicts the Forex derivatives:



Add-on for a hedging set for forex derivatives is calculated as per the guidelines.

**Add-on for Credit Derivatives:**

Following flowchart depicts the add-on calculation for credit derivatives:



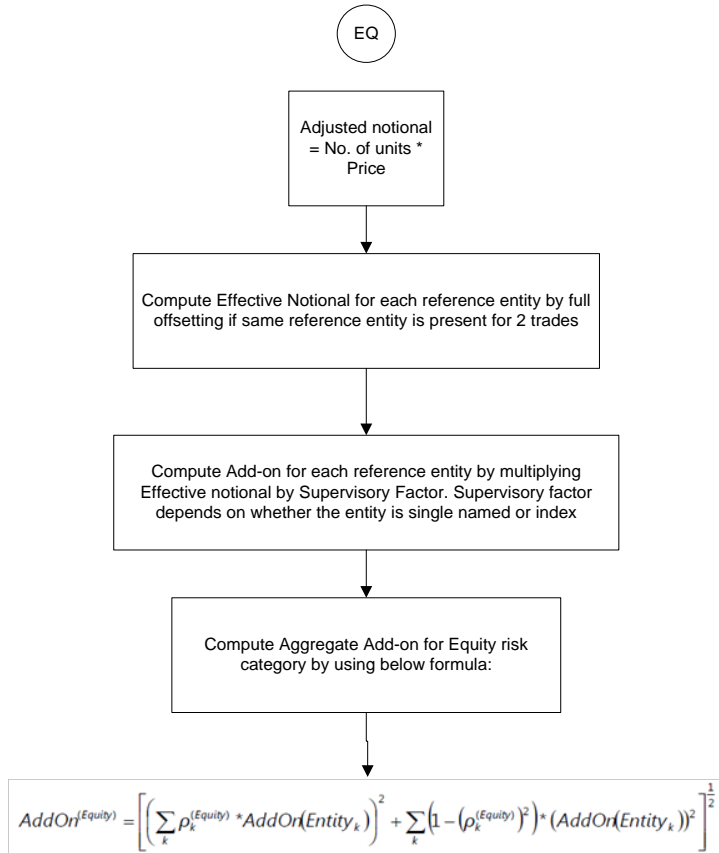
All credit derivatives that reference the same entity (either a single entity or an index) are allowed to offset each other completely to form an entity-level effective notional amount.

For single name entities, SF is determined by the credit rating of the reference name. For index entities, SF is calculated by determining if the index is investment grade or speculative grade. All entity level add-ons are grouped in a single hedging set, except for basis and volatility transactions for which full offsetting is not allowed.

For credit derivatives, add-ons are divided into systematic and idiosyncratic components. Entity Level Add-ons are allowed to be completely offset in systematic component whereas in the idiosyncratic component, there is no offsetting benefit.

**Add-on for Equity Derivatives:**

Following flowchart depicts the add-on calculation for Equity derivatives.



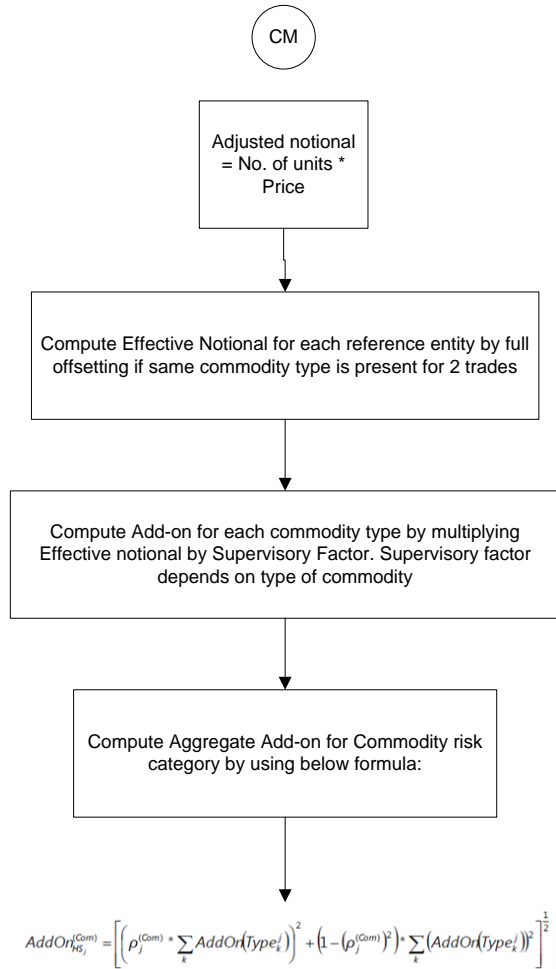
Equity derivative add-ons are based on a similar concept of systematic and idiosyncratic components. Derivatives referencing equity indices are measured as if those are referencing single equities but with a higher correlation factor.

Banks are not permitted to make any modeling assumptions regarding the Add-ons including estimating individual volatilities or taking publicly available estimates of beta. This is to ensure the consistency during implementation across multiple jurisdictions.

**Add-on for Commodity Derivatives:**

Following flowchart depicts the add-on calculation for Commodity derivatives.





Add-on for commodity derivatives are also divided into systematic and idiosyncratic components. Full offsetting is allowed between derivatives referencing same type of commodity. Partial offsetting is allowed within each hedging set between same types of commodities. No offsetting is permitted across hedging sets.

For a basis transaction hedging set, supervisory factor applicable to the relevant asset class is multiplied by 0.5. For a volatility transaction hedging set, supervisory factor applicable to the relevant asset class is multiplied by 5.

### Treatment of Multiple Margin Agreements and Multiple Netting Agreements

For both RC and PFE, if one of the netting agreement has multiple margin agreements, then this netting agreement should be divided into sub-netting agreements to align with the margin agreements.

If a single margin agreement applies to multiple netting agreements, RC is calculated by taking the maximum of the mark-to-market value of the derivative contract in the netting agreement, then subtracting the value of the collaterals against the margin agreement, and finally flooring this value to 0.

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 mark-to-market values of the derivative contracts.

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**NOTE:** CDO Tranches are not included in this release.

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## Commodity

Similar to credit derivatives and equity, offsetting for commodity derivatives are also permitted for the trades in the same commodity. The commodity is identified by the V\_UNDERLYING\_DATA\_IDENTIFIER column values in the respective derivative tables. The effective notional amount for a commodity type and the Add-on for commodity type are computed as per the guidelines. The individual commodity types column expects the values from DIM\_EXPOSURE\_UNDERLYING\_TYPE table.

For Long Settlement Transactions, the methodology described above will be replicated. The only difference will be that for the complete process, the transactions with long settlement transaction flag (F\_LONG\_SETTLEMENT\_TXN\_FLAG) = Y will be considered.

### *Data For Staging Tables*

Data for the staging tables (STG\_FUTURES, STG\_SWAPS\_CONTRACTS, STG\_OPTION\_CONTRACTS, and STG\_CREDIT\_DERIVATIVES) are provided with the appropriate underlying types. This ensures that the correct asset class and sub-class are assigned. For Commodity derivatives, data is provided for commodity code. Otherwise, the banks cannot avail the offsetting benefit for the offsetting of notional amount, as permitted by BIS.

Underlying type values in each of the derivative tables are listed in the previous paragraph are expected from the following codes:

- INTRAT
- EXRATE
- CREDIT
- IGRO
- NIGRO
- EQTY
- EQIDX
- OILGAS
- ELEPOW
- MET
- AGRI
- OTHCOM

The following are ensured:

- The correct hedging sets are formed and processed accordingly for margin agreement codes and netting agreement codes. Incorrect data in these columns may lead to inaccurate capital computation.
- For derivatives that have 2 legs in the books, same Deal Id should be provided with appropriate position indicators. This is to ensure that the correct treatment is applied to such positions and offsetting benefit is given to the bank wherever permitted.
- Netting agreement codes should be provided uniformly across the relevant transactions. This is to ensure that the correct calculation of PFE and also to help identify netting agreements in which trades exceed 5000.

### *Run Management*

You can choose between SA-CCR and IMM approach for CCR charge.

BIS has provided an option to choose if the banks want to recognize offset across maturity buckets or not.

To enable the offsetting option across maturity buckets for SA CCR approach for IR asset class, a new column namely V\_CCR\_IR\_BUCKET\_OFFSET has been introduced. If this column is provided with the value Y, then the solution uses the formula according to the guidelines for Offsetting. Otherwise, the formula for effective notional calculation for IR asset class from the guidelines is considered.

As the partial offset within a netting is not detailed in the accord, the same has not been included in the scope of the application.

## Capital Structure

### Overview

During the economic crisis, the global banking system had an insufficient level of high level quality capital. During the crisis it was revealed 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 sum of the following elements:

- Tier1 Capital

Common Equity Tier 1

Additional Tier 1

- Tier 2 Capital

Each component of Capital is subject to the following 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 Bank only. Most of the regulatory adjustment line items are to be deducted from CET1.

For a Banking organization the accounting entity that are not part of regulatory consolidation, the investment amount partly goes for deduction from its respective component of capital and partly goes for risk-weighting as per Banking or Trading book rule.

Significant entity investment amount (which are common shares) along with Mortgage Servicing Rights and DTA due to temporary differences) goes for threshold deduction where each line item are subject to 10% and 15% CET1 capital. Each line item which are above 10% and 15% limit are risk-weighted at 250%.

Securitization transaction, Equity Exposure under PG/LGD approach, and non-DvP and non-PvP transaction items which were formally in Basel II wherein 50% from Tier 1 and 50% from Tier 2 were deducted are risk-weighted at 1250%. All the regulatory adjustment line items will follow a phase-in arrangement from the beginning of 2014 till 2017.

In particular, the regulatory adjustments begins 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.

Capital Structure process takes input from Fact Non Sec Exposures (FCT\_NON\_SEC\_EXPOSURES) and Market Risk Exposures (FCT\_MARKET\_RISK\_EXPOSURES, only if market risk processing is a part of the Run). Capital Structure process is placed between Market Risk data processing (BASELIII\_MKT\_RISK\_DATA\_PROCESSING) and Market Risk position conversion (BASELIII\_MKT\_RISK\_POSITION\_CONVERSION) due to the following reasons:

- The Significant and Insignificant Investment Deductions involves splitting of certain exposures into multiple exposures (2 new exposures and deletion of the parent exposure). These split exposures should be Position Converted and RWA is calculated on these position converted exposures.

- The RWA for market risk exposures is calculated out of Market Risk Summary (FCT\_MARKET\_RISK\_SUMMARY) which contains one aggregated record for each instrument type. If the RWA for the split exposures is adjusted then it will be approximate in case the RWA is pro-rated between instrument types. It will be a repetition of same tasks (falling into cycles) if RWA is computed in this table again.

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**NOTE:** All the GL line items are expected at Solo level for each entity. The consolidated data will be discarded

While executing Solo Run the parent entity data is processed. Investment into the subsidiary data undergo 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 as well as the subsidiary data is considered. Regulatory Investment data to financial institutions which are part of regulatory consolidation is treated as an internal transaction. Those subsidiaries which are outside the scope of consolidation are treated as per Insignificant and Significant rule.

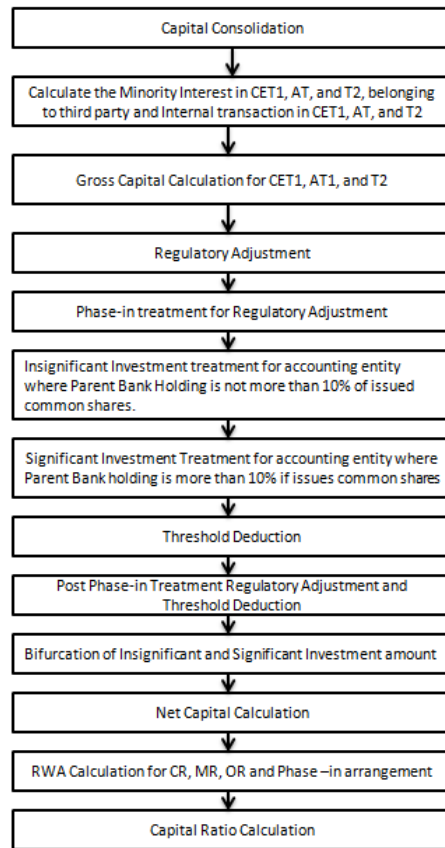
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### ***Assumption***

The regulatory adjustment that follows a phase-in arrangement and not deducted from CET1, needs to follow national treatment as per Basel III accord. Hence, we assume that the regulatory adjustment line item follows Basel II accord. Items which were formerly deducted from 50%-50% from Tier 1-Tier 2 capital will be deducted from AT1 and capital investment instrument not deducted from CET1 will be risk-weighted at 100%.

Since investment in accounting entities, (which are outside the scope of regulatory consolidation) by parent bank are long-term investments and mostly into equity related instruments, therefore these investments does not undergo any Credit Risk Mitigation process.

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).

**Process Flow**

- **Calculate the Minority Interest in CET1, AT, and T2, belonging to third party and Internal transaction in CET1, AT, and T2:** Minority Interest as per the Basel III guidelines 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 calculated as the third party's interest (share holding 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** in BASELIII\_CAPITAL\_STRUCTURE process covers the above processing.

The deduction also includes internal transactions in each tier of capital among the various entities which are part of the regulatory consolidation. Hence, minority interest attributed to third party as well as the internal transactions in each tier of capital is deducted from the gross capital of each tier of capital.

- **Gross Capital Calculation for CET1, AT1, and T2:** 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. The sub process – **Provisions and Gross Capital Calculations** in BASELIII\_CAPITAL\_STRUCTURE process covers this processing.

- **Regulatory Adjustment:** Goodwill and Other Intangibles, DTAs, Cash Flow Hedge Reserve, Gain on Sale of Securitization Transaction, cumulative gain and losses due to change in Own Credit risk, Defined Pension Fund Asset are direct download (in **STG\_GL\_DATA** table).
- **Insignificant Investment treatment for accounting entity where Parent Bank Holding is not more than 10% of issued common shares:** The total investment amount is checked against the set limit of 10% of CET1 amount of the parent bank amount post regulatory adjustments. The amount above 10% limit goes for deduction. 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 trading book and banking book rule for the instrument belonging to trading book and banking book respectively.

The application computes as follows:

- Entities are marked as insignificant investment entities by updating the flag: **F\_SIGNIFICANT\_INVESTMENT\_IND** in Fact Entity Information (**FCT\_ENTITY\_INFO**) with value N.
- The exposure amount of banking book and trading book 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 done 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 **FSI\_NON\_REG\_CONSL\_ENTITY\_INVST** which is the processing table for insignificant and significant investment deductions.
- The sub process – **Insignificant Investment in entities outside Regulatory Consolidation Processing** in **BASELIII\_CAPITAL\_STRUCTURE** process covers the above processing.

**Significant Investment Treatment for accounting entity where Parent Bank holding is more than 10% if issues common shares:** The total investment amount is checked against the set limit of 10% of CET1 amount of Parent bank post insignificant investment amount adjustment. The CET1 amount above 10% is deleted 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 – '**F\_SIGNIFICANT\_INVESTMENT\_IND**' in Fact Entity Information (**FCT\_ENTITY\_INFO**) with value 'Y'.
- The exposure amount of banking book and trading book 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 Regulatory Consolidation Processing**' in **BASELIII\_CAPITAL\_STRUCTURE** process covers the above processing.

- **Threshold Deduction:** 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 goes for Threshold deduction. These three line items are compared with 10% CET1 individually. The portion that exceeds 10% limit is deducted from CET1. The remainder amount after deduction are summed up and compared with 15% CET1. Again the portion that exceeds this 15% limit is deducted from CET1 capital. The entire processing is done in the sub process – '**Threshold Treatment Calculations**' in the process – **BASELIII\_CAPITAL\_STRUCTURE**.
- **Phase-in arrangement:** The regulatory adjustment line items that include Goodwill, DTA, Cash Flow Hedge Reserves, Gain on Sale related to Sec transaction, Defined Pension Fund, Cumulative Gain and losses due to changes in own credit risk, Treasury Stock, and Reciprocal cross-holding will follow Phase-in arrangement as per the timelines defined in the Basel III accord. Similarly, Insignificant Investment, Significant Investment, and Threshold deduction amount line items will also follow phase-in arrangement post Insignificant, Significant and Threshold treatment calculation. The phase-in deduction percent for each year is available in a setup table - **FSI\_SETUP\_CAPITAL\_HEAD**.

V_STD_ACC T_HEAD_ID	N_CAPITAL_COM PONENT_VALUE	D_STAR T_DATE	D_END _DATE	F_LATEST_RECO RD_INDICATOR	V_STD_ACCT _HEAD_DESC	V_CAPITAL_ADEQU ACY_REGULATOR
CAP936	0.20	1/1/2012	12/31/2 012	Y	Phase-in Regulatory Deduction	BIS
CAP936	0.20	1/1/2013	12/31/2 013	Y	Phase-in Regulatory Deduction	BIS
CAP936	0.20	1/1/2014	12/31/2 014	Y	Phase-in Regulatory Deduction	BIS

The entire processing is done in sub processes – **Provisions and Gross Capital Calculations** and **Post Phase In Treatment calculations** in process – **BASELIII\_CAPITAL\_STRUCTURE**

- **Bifurcation of Insignificant and Significant Investment amount:** All the investment transactions in Insignificant Entity and Significant Entity goes for bifurcation. Insignificant investment amount below 10% are stamped as "INSIG\_RWA" and any amount above 10% are stamped as "INSIG\_DED". The same logic is applied to Significant Investment amount in CET1. The CET1 amount in Significant Investment entity that is below 15% limit is stamped as "SIG\_RWA" and amount above 10% and 15% limit is stamped as "SIG\_DED". The original transactions are deleted and new transactions are created with the stamping as described above. The new transaction thus created can be traced back by looking into the parent exposure id.

The exposure to be deducted is marked with Standard account head surrogate key based on whether the deduction is Insignificant or Significant investment and based on capital component group.

This splitting of exposures is done in Fact Non Sec Exposures (**FCT\_NON\_SEC\_EXPOSURES**) and Market Risk Exposures (**FCT\_MARKET\_RISK\_EXPOSURES**). This splitting logic is carried to Equity Exposures (**FCT\_EQUITY\_EXPOSURES**) and Fact Sub Exposures (**FCT\_SUB\_EXPOSURES**) as well.

The entire processing is done in the sub processes – Non Sec Insignificant Investment Exposure Processing, Mkt Risk Insignificant Investment Exposure Processing, Non Sec Significant Investment Exposure Processing, Mkt Risk Significant Investment Exposure Processing, Non Regulatory Investment Sub Exposures Population and Equity Non Regulatory Investment Processing in the process – **BASELIII\_CAPITAL\_STRUCTURE**.

- **Net Capital Calculation:** 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** in process  
**BASELIII\_CAPITAL\_STRUCTURE**.

- **RWA Calculation for Credit Risk, Market Risk, Operational Risk and Phase –in arrangement:** The RWA amount for Non Securitization, Securitization, Market Risk, and Operational Risk are calculated by summing up the RWA amount and is reported under different heading as “Risk Weighted Asset amount for Standardized Portfolios” for Non-Sec, “Sec Std RWA” for Sec portfolio, “Market Risk RWA” for Market Risk and “Operational RWA” for OR. The Total RWA amount is the summation of Non-Sec, Sec, MR, OR, and Phase-In RWA.

The above processing is done in sub process – **RWA Populations** in process –  
**BASELIII\_CAPITAL\_STRUCTURE\_CAPITAL\_RATIO**.

- **Capital Ratio calculation:** CET1 ratio, T1 ratio, T2 ratio, and Capital Adequacy ratio are calculated using the Total RWA amount and Net CET1 Capital, Net T1 Capital, Net T2 capital and Total Capital (sum of Net T1 Capital amount and Net T2 capital amount) amount.

This is done in sub process – **Capital Ratio Calculations** in process –  
‘BASELIII\_CAPITAL\_STRUCTURE\_CAPITAL\_RATIO’.

### Key Data Elements

A few 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 refer to the Download Specifications document.

- Entity details which are part of regulatory consolidation and parent entity share holding percent.
- 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 are 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**). For more information refer to the sample data.

V_STD_ACC T_HEAD_ID	N_CAPITAL_COM PONENT_VALUE	D_STAR T_DATE	D_END _DATE	F_LATEST_RECO RD_INDICATOR	V_STD_ACCT_ HEAD_DESC	V_CAPITAL_ADEQU ACY_REGULATOR
CAP820	0.035	1/1/2013	12/31/20 13	Y	Required Common Equity Tier 1 Capital Ratio	RBI
CAP820	0.04	1/1/2014	12/31/20 14	Y	Required Common Equity Tier 1 Capital Ratio	RBI
CAP820	0.045	1/1/2015	12/31/99 99	Y	Required Common Equity Tier 1 Capital Ratio	RBI
CAP821	0.045	1/1/2013	12/31/20 13	Y	Required Tier 1 Capital Ratio	RBI



V_STD_ACC T_HEAD_ID	N_CAPITAL_COM PONENT_VALUE	D_STAR T_DATE	D_END _DATE	F_LATEST_RECO RD_INDICATOR	V_STD_ACCT_ HEAD_DESC	V_CAPITAL_ADEQU ACY_REGULATOR
CAP821	0.055	1/1/2014	12/31/20 14	Y	Required Tier 1 Capital Ratio	RBI
CAP821	0.06	1/1/2015	12/31/99 99	Y	Required Tier 1 Capital Ratio	RBI
CAP822	0.08	1/1/2013	12/31/99 99	Y	Required Capital Adequacy Ratio	RBI
CAP820	0.035	1/1/2012	12/31/20 12	Y	Required Common Equity Tier 1 Capital Ratio	BIS
CAP820	0.04	1/1/2014	12/31/20 14	Y	Required Common Equity Tier 1 Capital Ratio	BIS
CAP820	0.045	1/1/2015	12/31/99 99	Y	Required Common Equity Tier 1 Capital Ratio	BIS
CAP821	0.045	1/1/2012	12/31/20 13	Y	Required Tier 1 Capital Ratio	BIS
CAP821	0.055	1/1/2014	12/31/20 14	Y	Required Tier 1 Capital Ratio	BIS
CAP821	0.06	1/1/2015	12/31/99 99	Y	Required Tier 1 Capital Ratio	BIS
CAP822	0.08	1/1/2012	12/31/99 99	Y	Required Capital Adequacy Ratio	BIS

The Total RWA (CAP838) for the entity that has third party minority holding in it is a download value in STG\_STANDARD\_ACCT\_HEAD.

## Capital Buffers

### Overview

There are three types of Capital Buffers are prescribed in the Basel III Accord which are as follows:

- 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.

### Capital Conservation Buffer (CCB)

The Basel III Accord requires banks to maintain Capital Conservation Buffer (CCB) out of Common Equity Tier 1 Capital (CET1). This requirement is as per the transitional arrangement as stated in the Basel guidelines.

### Countercyclical Buffer

The Basel III Accord requires banks to maintain Countercyclical Buffer that is prescribed by the respective jurisdiction's regulator through an extension of CCB. The Basel Regulatory Capital 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.

In case the guarantor and credit default swap is present for an exposure, as per the Basel guidelines the

application considers the domicile country of these mitigants for the covered portion and country of exposure counterparty for uncovered portion. After calculating the weighted average, the application then computes a single value for Countercyclical Buffer benchmark which will be applicable on all exposures of all jurisdictions.

### **Additional Loss Absorbency Capital (for G-SIB)**

If a group is categorized a Globally–Systematically Important Banks (G-SIB), then the application identifies all subsidiaries in various jurisdictions as G-SIB as well. This is based on our interpretation of the Basel guidelines that are applicable for a specific group. 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 Basel guidelines. Loss absorbency is required to be met as an extension of CCB for computational purposes.

### **Calculation of Capital Conservation Buffer / Available Buffer from CET1 Capital**

The value that the Basel Regulatory Capital application calculates for Available Buffer from CET1 Capital meets the buffer requirements for all three buffers - Capital Conservation Buffer (CCB), Countercyclical Buffer, and Additional Loss Absorbency Capital Requirement. No priority is given to any buffer over another. Hence, the shortfall or excess (if any) is calculated and reported at an aggregate level. The required total buffer is calculated as the sum of the required values of three individual buffers.

The application also computes CET1 and Buffer Lookup Ratio, which is further required for calculating Minimum Capital Conservation Ratio. To calculate this buffer, remainder of following is taken:

- Excess of CET1 Capital Ratio over the benchmark (4.5%), after catering to the shortfall (if any), in the Additional Tier 1 and Tier 2 Capital to their respective benchmark levels (1.5% and 2% respectively).

Hence, CCB excludes any additional CET1 needed to maintain 6% of Tier 1 Capital Ratio and 8% of Total Capital Ratio.

### **Capital Conservation Ratio**

The required buffer from CET1 Capital (sum of three required buffers) is compared with Available Buffer from CET1 Capital. If the banks are unable to meet their total buffer requirements for all the three buffers, then they are subject to constraints on the discretionary payments of earnings. In this case the Capital Conservation Ratio is calculated and represents the percentage of net earnings after tax (positive) not distributed by the bank and held back as retained earnings. Capital Conservation Ratio of the current year is applied after 12 months from the time of calculation. This is ascertained by the minimum Capital Conservation Ratio range for a given CET1 and Buffer Lookup Ratio in a table. This table is dynamic and formula driven and is constructed by the application using the values of the three required buffers as per the Basel guidelines. The application constructs the range of CET1 and Buffer Look-up ratio (Lower Limit and Upper Limit) for the required Capital Conservation Ratio in four quartiles.

**Lower Limit = 0.000001 + Upper Limit of (n-1)<sup>th</sup> quartile**

**Lower Limit of first quartile =- 0.045**

**Upper Limit = 0.045 + (Total Required Buffer from CET1 Capital \* 0.25 \* n)**

Where n is the quartile number

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**NOTE:** The application calculates Capital Buffers at consolidated level for the reporting bank. However, at the discretion of national supervisors, this can be applied at solo level as well. In such cases, the calculation of solo level for the respective jurisdictions has been included in the application.

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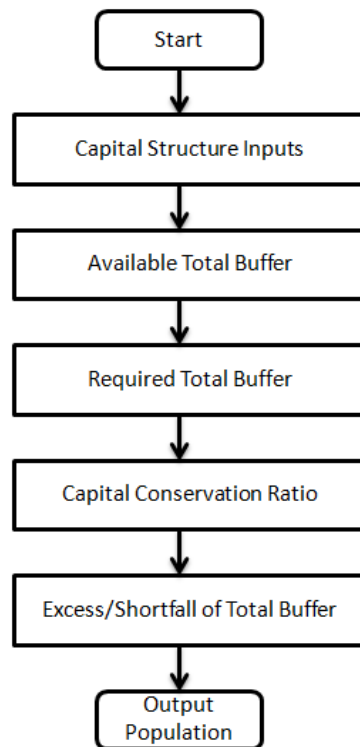
### ***Assumptions***

Countercyclical Buffer requirement for each country should 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 should 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 both 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 will 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%

### *Process Flow*



The tasks related to capital buffer calculations are present in the process named **CAPITAL\_BUFFER**. The processing is as following:

- **Capital Structure Inputs**

The Capital Structure Rules are executed before the calculation of buffers. These Rules calculate the available capital ratios and required capital ratios of the three capital components which are Common Equity Tier 1 Capital ratio, Tier 1 Capital Ratio, and Capital Ratio.

These line items are populated in the **Fact Standard Accounting Head** table.

- **Available Total Buffer:** Calculation of Available Buffer from CET1 Capital is performed using inputs taken from Step 1.
- **Required Total Buffer:**

Calculation of Required Capital Conservation Buffer (CAP823) - Required Total Buffer is the sum of three required buffers

Calculation of Required Additional Loss Absorbency: A Rule in the application contains additional source hierarchy to identify whether a bank is a G-SIB bank or not. The value is checked in the **Loss Absorbency Capital Bank Override** column of the table **Fact Entity Information** and populated to **Fact Standard Accounting Head**. This value will have precedence over the bucket specified. If the value is not present in the **Loss Absorbency Capital Bank Override** column, then the loss absorbency percent is taken from the column **Bucket Loss Absorbency Capital** of the **Benchmark Loss Absorbency Ratio** table based on the loss absorbency bucket the bank belongs to.

Required Countercyclical Buffer: Required Countercyclical Buffer Ratio table is updated with values using a T2T. The values are taken from **Benchmark Counter Cyclical Buffer Ratio** table. The **Regulator Code** column in Benchmark Counter Cyclical Buffer Ratio is compared to jurisdiction code column in Run Dimension. This T2T aggregates the country wise exposure amount for each country. In cases where no Countercyclical Buffer is available, the required weighted average will be 0 as the benchmarks will be assumed to be 0. (If there is no countercyclical requirement, we expect the regulator to provide 0 as the benchmark.)

After the T2T loading, based on each country's requirement for countercyclical buffer, the weighted average Countercyclical Buffer is calculated.

Calculation of Required Buffer from CET1 Capital, Tier1 and Capital Adequacy Ratio: For the calculation of these required buffers, based on **n\_upd\_cap\_comp\_group\_skey** (which corresponds to BFCET1 - Buffers from CET1 for Required Buffer from CET1 Capital, BFT1 - Buffers from T1 for Required Buffer from T1 Capital and BFCAR - Buffers from CAR for Required Capital Adequacy Ratio), the standard account head amount is summed up and populated against the corresponding cap id in **Fact Standard Accounting Head** table.

- **Capital Conservation Ratio:**

Capital Conservation Ratio is calculated based on Required CET1, buffers and the setup or semi-static tables as per the year when the Run is executed.

Capital Conservation ratio is updated in Fact Capital Conservation Ratio. The values are populated through a T2T.

- **Excess/Shortfall of Total Buffer:**

The calculated values (only positive values are considered) are stored against the corresponding Cap IDs as two separate line items of which one will be 0.

### **Key Data Elements**

A few key data elements have been elaborated in this section. For a complete list of tables to be updated refer to the Download Specifications document.

Countercyclical Buffer requirement for each country should be provided by the client or the bank as the percentage applicable for each country and this is dependent on the home regulator's jurisdiction as it 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 should be the one that the home regulator agrees to.

G-SIB status and applicable bucket information for each entity should 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 for 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 both 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) needs to be met as per the transitional arrangement, the required buffer value needs to be setup in Setup Capital Heads (**FSI\_SETUP\_CAPITAL\_HEAD**) 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 needs to 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 T2T REQ\_CNTR\_CYC\_BUFFER\_POP can be modified to consider only credit risk. For this, joins corresponding to market risk can be deleted from the T2T.

The additional loss absorbency requirement specified by different regulators for different buckets should 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 of direct input of applicable loss absorbency percentage. This is also useful when the percentage applied is different from the corresponding bucket percentage. This should be given in the column n\_loss\_abs\_override of the table Stage Legal Entity Details (STG\_LEGAL\_ENTITY\_DETAILS). If this column has value, it is given priority over loss absorbency percentage corresponding to the bucket.

The minimum Capital Conservation Ratios requirement for different quartiles specified by different regulators 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.

**Leverage Ratio****Overview**

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 Basel committee 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%. Regulatory leverage ratio is calculated as an arithmetic mean of the monthly leverage ratio over a quarter. Monthly Leverage Ratio is calculated at the end of the month. The leverage ratio is calculated by dividing an institution's capital measure by the total exposure.

$$\text{Leverage Ratio} = \text{Capital Measure} / \text{Exposure Measure}$$

Capital Measure is defined as Net Tier 1 Capital which 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, Over the Counter (OTC), Structured Financial Transactions (SFT), securitization, and all market related instrument's transaction amounts. Mitigation amount is not considered while calculating exposure amount. An additional Total Asset of the Entity (where parent bank holding is more than 10% of the issued common share capital of the entity and entity is not part of the regulatory consolidation) also forms a part of the Exposure Measure.

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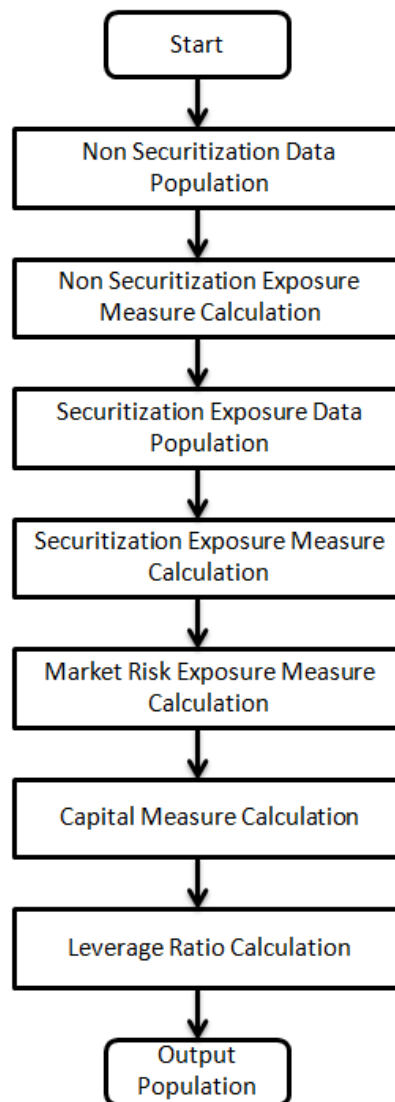
**NOTE:** While executing a solo Run, the parent entity's exposure amount related to on-balance sheet items, off-balance sheet items, OTC, SFT, securitization, and market related instruments are considered. The total consolidated asset of the significant entity is not calculated in exposure measure while executing a solo Run. Executing a consolidated Run requires subsidiary data and total consolidated assets of significant investment entity.

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### *Assumptions*

Total additional asset to be included in the Exposure Measure calculation for the Significant Investment subsidiary, is not explicitly stated in the Basel III Rules (June 2011 revision), hence we have followed the instructions as published by BIS in Sept 2011 (page 34) for Basel III implementation monitoring, where the formula of total additional asset to be included in exposure measure is provided. Also, the Basel III accord is silent on the inclusion of securitization and market related transactions, however the application has considered securitization as well as the market related transactions in the calculation of Leverage Ratio.

### *Process Flow*



A prerequisite for leverage ratio processing is Staging Market Risk Data Population. Market risk exposure is

aggregated from the outstanding positions of the instruments. Hence, population of market risk positions is a pre-requisite for the exposure measure calculation of market risk. Market risk positions are calculated by executing the Run **Basel III Staging Data Population - Market Risk - BIS Standardized Approach**.

Leverage ratio is calculated by executing the Run **Basel III Leverage Ratio Calculation**. This Run contains the following processes

- BASELIII\_CAPITAL\_CONSOLIDATION
- PARTY\_RECLASSIFICATION\_STD
- NON\_SEC\_DATA\_POPULATION
- NON\_SEC\_LEVERAGE\_RATIO
- SEC\_DATA\_POPULATION
- SEC\_LEVERAGE\_RATIO
- MKT\_RISK\_LEVERAGE\_RATIO
- BASELIII\_CAPITAL\_STRUCTURE
- LEVERAGE\_RATIO

The process flow for calculation of leverage ratio is as follows:

- **Non Securitization Exposure Data Population:** Data from the Product Processors are populated to **non sec processing** table in the process NON\_SEC\_DATA\_POPULATION. Non Sec Exposure Measure used in the Leverage ratio is the summation of the following products:

On-Balance Sheet Item

Repo-Style Transaction

Derivative Transaction

Off-Balance Sheet Item

Details on the calculation of these exposure measures are mentioned in the following section.

- **Non Securitization Exposure Measure Calculation:** After data is populated in non sec processing table, the exposure measure is calculated in the process NON\_SEC\_EXPOSURE\_MEASURE\_CALCULATION. As the CCF value, (which is further used in exposure measure calculations) for off-balance sheet items are different for leverage ratio calculation and capital calculation, leverage ratio cannot be calculated as part of the Capital Calculation Run.

Details on the calculation of non sec exposure measures are as follows:

**On Balance Sheet Items** – The accounting value of the on-balance sheet items is considered. The on-balance sheet item is the net of specific provisions and valuation adjustments. The following items are not considered while calculating the exposure measure for on-balance sheet item thereby reducing the exposure amount:

- Physical or financial collateral
- Guarantee or credit risk mitigants elements
- Netting of Loans and deposits.

The exposure amount for on-balance sheet items is a download amount and is available as an input data. Nettable transaction related to OTC, SFT, internal transactions (like inter group transaction), treasury stock and reciprocal cross-holding is not a part of on-balance sheet transactions.

**Repo-Style Transaction** – Repo-style transaction (repo/reverse repos and securities lending/borrowing) that follows the bilateral netting agreements forms a part of exposure measure. To calculate the exposure amount for Repo transactions, the application follows the same treatment as prescribed in the Basel II guidelines. The Repo

transaction undergoes volatility and FOREX haircut as defined in Basel II guidelines before calculating the exposure amount.

**Derivative Transaction** – Derivative transactions (OTC Derivatives) are calculated using the Current Exposure Method as prescribed in the Basel II guidelines. All derivative transactions including Credit Default Swap are assigned an add-on percent based on the underlying type as per the Current Exposure Method. The add-on assignment is as per the table provided in the Annexure 4 of Basel II guidelines. The exposure amount is the sum of current exposure amount and the notional principal multiplied by the add-on percent. Transactions in which bilateral netting is applicable, the exposure amount is netted and calculated.

**Off-balance sheet items** – All the off-balance sheet items listed below are converted into credit exposure equivalent through CCF assignment:

- Commitments (including liquidity facilities)
- Unconditionally cancellable commitments
- Direct credit substitutes
- Acceptances
- Standby letters of credit
- Trade letters of credit
- Failed transactions and unsettled securities

100% CCF is uniformly assigned. However, any commitment that is unconditionally cancellable at any time by the bank without prior notice, a CCF of 10% is applied. The exposure amount for off-balance sheet items is obtained after multiplying the undrawn amount with the CCF percent and the exposure amount.

- **Securitization Data Population:** Securitization exposure data is populated to securitization processing table in the process SEC\_DATA\_POPULATION.
- **Securitization Exposure Measure Calculation:** After securitization exposure data is populated, exposure measure is calculated in the process SEC\_EXPOSURE\_MEASURE\_CALCULATION. Securitization transactions follow the accounting measure of exposure. The exposure amount of both the originator and investor are considered to arrive at the exposure amount. The securitization transaction where CCF assignment is applicable is assigned as prescribed in the Basel II guidelines.
- **Market Risk Exposure Measure Calculation:** Market risk data that is populated through Staging MR data population Run, is populated in the market risk processing table and the exposure measure is calculated in the process MKT\_RISK\_EXPOSURE\_MEASURE\_CALCULATION. The following market related instruments are considered for exposure measure. The total exposure measure used in the leverage ratio is the sum of the exposure amount for all products:

Interest rate

Equity

Forex

Commodity

Options

Netting of long and short position is done at instrument level. The post netting value is considered as exposure measure. While calculating exposure amount for subsidiaries that are part of regulatory consolidation and used in the leverage ratio, the exposure amount is limited to the share-holding percentage. For example: A subsidiary which is part of regulatory consolidation and parent holding in the subsidiary is 45%, only exposure amount limited to 45% is considered for exposure measure calculation. Similarly, if the holding is more than 50%, the entire amount is considered for exposure measure calculation.



- **Capital Measure Calculation:** Capital measure is calculated in BASELIII\_CAPITAL\_STRUCTURE process. Capital Measure used in the leverage ratio is equal to Net Tier 1 and is calculated as follows:

$$\text{Net Tier 1 capital} = \text{CET1 Capital} + \text{AT1 Capital} - \text{Regulatory Adjustment to CET1} - \text{Regulatory Adjustment to AT1}$$

For more information on calculating Net Tier 1 Capital, refer to *Capital Structure* on Page 55.

- **Leverage Ratio Calculation:** The calculation of leverage ratio is detailed as follows:

**Total Additional Asset of Significant Investment Entity where Bank owns more than 10% of Issued Capital:** Subsidiaries that are outside the scope of regulatory consolidation (as defined in the Basel III accord, Para 84) where parent bank owns more than 10% of the issued common share capital of the entity, subsidiary's additional assets are to be included in the exposure measure (as per Para 156 of the Basel III Accord). The **total assets to be included in the exposure measure** is calculated as follows:

**Total assets of the entity (included in the consolidated figures) multiplied by the percentage of the entity's capital that has not been deducted, less the share of the investment that has not been deducted.**

To arrive at the percentage of the entity capital that has not been deducted, (Investment in capital not deducted and total investment will be considered) is derived as follows:

#### Capital not deducted/Total Investment

The total consolidated asset of an accounting entity is captured in the **entity share holding** table and the percentage of subsidiary capital that has not been deducted is obtained from the capital calculation (for more information refer to *Capital Structure* on Page 55.), where the application calculates the percentage of amount deducted, which in turn is deducted from the value 1 to obtain the value of percentage not deducted.

Total additional asset amount is populated from **entity details** table to the **entity processing table** for further processing. This amount is used during total exposure measure amount calculation.

#### Total Exposure Measure Amount Calculation

The exposure amount for each category of product along with total additional Asset for significant investment entity is calculated and summation of all transactions related to each category of the product is stored against each line separately. Exposure measures for different products are aggregated against different standard account heads in **accounting head processing** table.

Standard Account Head Identifier	Standard Account Head Description
CAP846	Exposure Measure of On-Balance Sheet Item and Off-Balance Sheet Item
CAP850	Exposure Measure of OTC and SFT transaction
CAP847	Exposure Measure for Market Related Instrument
CAP849	Exposure Measure for Sec Transaction
CAP851	Exposure Measure for Total Additional Asset for Significant Investment Entity
CAP848	Total Exposure Amount

If the exposure measure of any of the product is calculated by any other application other than OFS Basel Regulatory Capital application, a provision is made available to provide these values against the respective standard account head IDs in the staging table for **non-accounting data** table.

**Current Month Leverage Ratio:** The application uses the Total Exposure Measure amount and Net Tier 1 Capital to calculate the current month leverage ratio by dividing the Net Tier1 capital by Total Exposure Measure amount. The amount is stored under the standard account description as "Leverage Ratio" and head ID CAP843.

**Regulatory Leverage Ratio:** The regulatory leverage ratio is the mean of three month leverage ratio using the current month leverage ratio and previous two months' leverage ratio which is a download value. The regulatory leverage ratio is stored against the standard accounting ID CAP842. Leverage and the regulatory leverage ratio is calculated in the process **LEVERAGE\_RATIO**.

To calculate the regulatory leverage ratio the application requires the previous two current month leverage ratio. The client or the bank should provide the previous two month leverage ratio value as a download in STG\_STANDARD\_ACCOUNTING\_HEAD against the standard accounting head ID CAP844 and CAP845 corresponding to previous month leverage ratio and second previous month leverage ratio.

If the leverage ratio Run batch is executed separately for the past two months, then these values are populated back to staging table for **non-accounting data** table for the current execution date. The Run Basel III Staging Data Creation - Previous Month Leverage Ratio is created with the T2Ts LEVERAGE\_RATIO\_PREVIOUS\_MONTH\_DATA\_POPULATION and LEVERAGE\_RATIO\_SECOND\_PREVIOUS\_MONTH\_DATA\_POPULATION. You need to change the Run skey of the Runs corresponding to previous two months' leverage ratio calculation Run, before executing this Run. This Run needs to be executed prior to executing the leverage ratio calculation Run.

### *Key Data Elements*

The a few key data elements have been elaborated in this section. For a complete list of tables and columns to be populated refer to the Download Specifications document.

To calculate the leverage ratio, exposure amount for all product types are required as well as total consolidated asset for significant investment entity is required to calculate exposure measure. The key data elements for exposure measure calculation of the various product types are as follows:

- On-Balance Sheet Item: For on-balance sheet items, End of Period (EOP) balance amount, write-off, and accrued interest amount is required.
- Repo-Style Transaction: For repo products, exposure amount, and instrument rating are required.
- Derivative Transaction: For derivative products, exposure mark to market value, notional principle amount, and underlying instrument types are required.
- Off-Balance Sheet Item: For off-balance sheet items, undrawn amount is required.
- Securitization Transaction: For securitization transactions, exposure amount is required.
- Market risk related instrument: For market risk instruments, the unit price as well as the number of units are required.
- Total consolidated asset of the significant investment entity: The total consolidated asset value of the significant investment entity is required.

## **Credit Valuation Adjustment**

### *Overview*

Basel committee has introduced a new Credit Valuation Adjustment (CVA) capital charge, which is added to default risk capital charge to arrive at the new Counterparty Credit Risk capital charge. The mark to market counterparty credit losses or the spread migration risk is captured with CVA, which were 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 OTC portfolio of a bank. When using the standardized approach, it is calculated at Portfolio level. CVA Charge is not applicable for the trades with a central counterparty and

Structured Financial Transactions (SFT). SFT is applicable only if the supervisor specifically mentions the same. You can include or exclude SFT in CVA calculation in the Run Management screen. Portfolio level considers all the trades in different OTC product 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 counterparty for calculation of CVA Charge. 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 both IMM approval and Specified Interest Rate Risk as a part of 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 both IMM approval Specified Interest Rate Risk as a part of approved VaR model for bonds,

**CCR Capital Charge = Default Risk Capital Charge + Advanced CVA Capital Charge**

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**NOTE:** All the OTC Derivatives products are part of CVA calculations. SFTs are included if you select the option from Run Management Screen. Also, trades with Central Counterparty (CCP) are excluded from CVA Charge calculations.

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### *Assumptions*

CVA hedge should be identified by the clients separately. Only single name CDS and Index Hedge are eligible for CVA. The Basel III Accord does not clearly mention whether index hedge position should be marked to the counterparty or not. The Basel Regulatory Capital application handles the index position in the following manner:

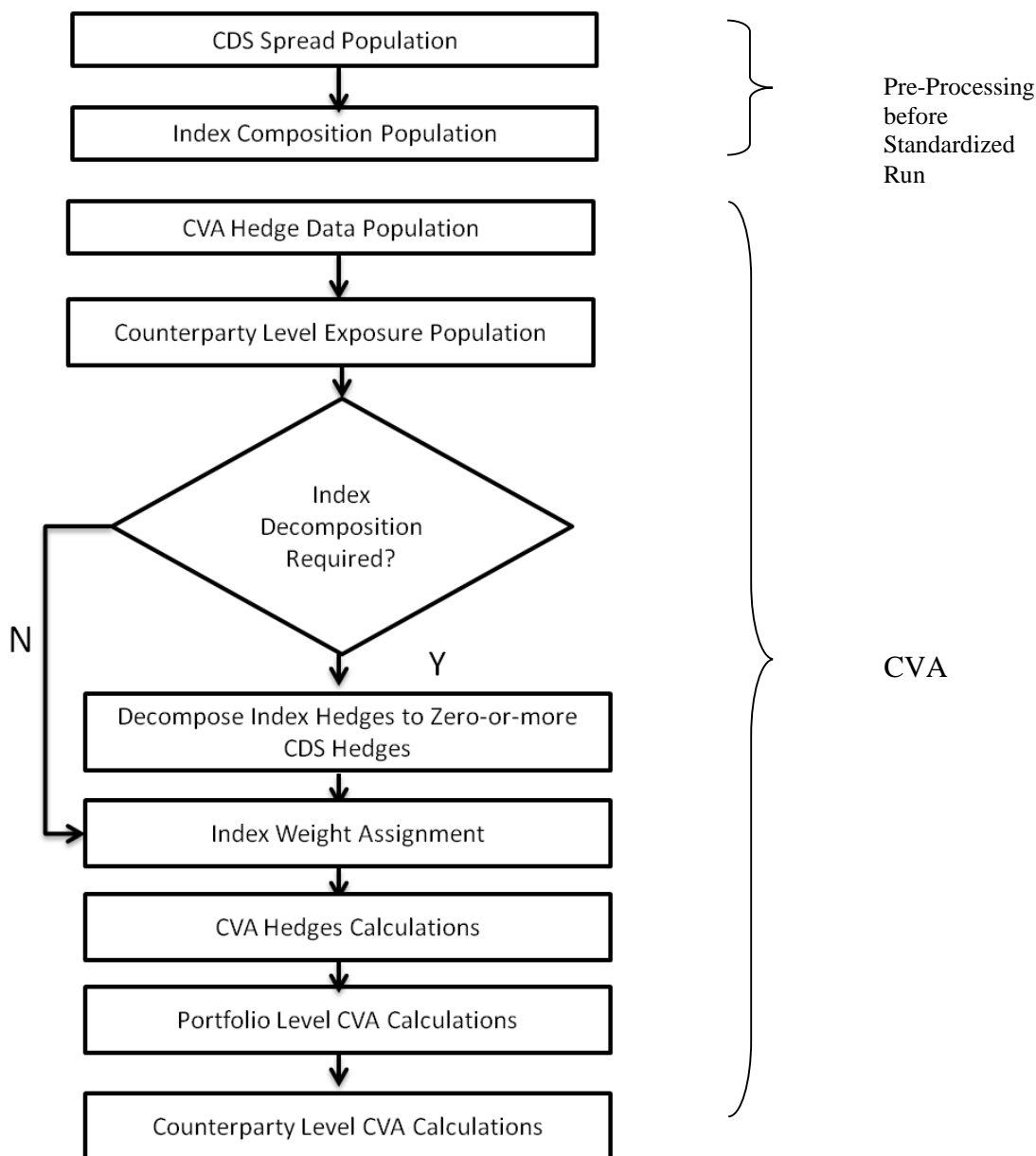
1. Both Index position marked to the level of counterparty or not marked to the level of counterparty is handled by the application.
2. Effective index hedge amount is considered in CVA charge calculation at portfolio level without considering whether it is marked to the counterparty or not.
3. If the 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 standardized approach.

### *Process Flow*

#### **Standardized Approach**

The application calculates CVA Capital Charge at portfolio level using the following formulae as specified by Basel guidelines:

$$K = 2.33 \cdot \sqrt{h} \cdot \sqrt{\left( \sum_i 0.5 \cdot w_i \cdot (M_i \cdot EAD_i^{total} - M_i^{hedge} B_i) - \sum_{ind} w_{ind} \cdot M_{ind} \cdot B_{ind} \right)^2 + \sum_i 0.75 \cdot w_i^2 \cdot (M_i \cdot EAD_i^{total} - M_i^{hedge} B_i)^2}$$



- **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.
- **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 assignment of weight to the index.

**V\_REF\_ENTITY\_PARTY\_ID:** This field captures the counterparty of the hedge transaction.

- **Counterparty Level Exposure Population:** The application expects the uncovered EAD at netting agreement level or at trade level. This is available as an output of Current Exposure Method (CEM). If more than one netting agreement is available, then the exposures are summed at counterparty level. Maturity adjustment discount factor is computed at netting agreement level or for each netting agreement using the formula  $1 - \exp(-0.05 * M_i) / (0.05 * M_i)$ .

Maturity is the notional weighted maturity at netting agreement level. The application sums the data for exposure at 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 counterparty level and stored in 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%

- **Index Decomposition Required:** You can select index decomposition which is executed in the Run Management screen. 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 single name CDS Hedge is created, so as to get maximum benefit from Hedging. Maturity of the single name CDS hedge is considered same as the maturity of index.
- **Index Weight Assignment:** The application derives the weight for each index by assigning 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 index. After getting 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.
- **CVA Hedge Calculations:** After population of hedge data and creation of single name CDS hedge from index, the application sums the notional to counterparty level and populates in CVA Specific table. Maturity Adjustment discount factor is computed using the formula  $(1 - \exp(-0.05 * M_{ihedge})) / (0.05 * M_{ihedge})$ . If more than one CDS Contract is available for the counterparty, the above 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  $(1 - \exp(-0.05 * M_{ind})) / (0.05 * M_{ind})$ . If more than one index hedge is available then index hedge amount is summed. All the above data

required for CVA calculation is populated from Mitigants data to CVA specific table. The data is summed for each counterparty and stored.

- **Portfolio Level CVA Calculation:** Portfolio Level CVA Charge is calculated as per the following formula:

$$K = 2.33 \cdot \sqrt{h} \cdot \sqrt{\left( \sum_i 0.5 \cdot w_i \cdot (M_i \cdot EAD_i^{total} - M_i^{hedge} \cdot B_i) - \sum_{ind} w_{ind} \cdot M_{ind} \cdot B_{ind} \right)^2 + \sum_i 0.75 \cdot w_i^2 \cdot (M_i \cdot EAD_i^{total} - M_i^{hedge} \cdot B_i)^2}$$

- **Counterparty Level CVA Calculation:** CVA Capital Charge at counterparty level is allocated using the following formula:

$$WCVA_i = \frac{\text{Absolute}[0.5 \cdot W_i \cdot (M_i \cdot EAD_{itotal} - M_{ihedge} \cdot B_i) - \sum_{ind} [(W_{ind}) \cdot M_{ind} \cdot B_{ind}]]}{\sum_{i=1}^n \text{Absolute}[0.5 \cdot W_i \cdot (M_i \cdot EAD_{itotal} - M_{ihedge} \cdot B_i) - \sum_{ind} [(W_{ind}) \cdot M_{ind} \cdot B_{ind}]]}$$

### Key Data Elements

A few 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 refer to 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.

### Out of Scope

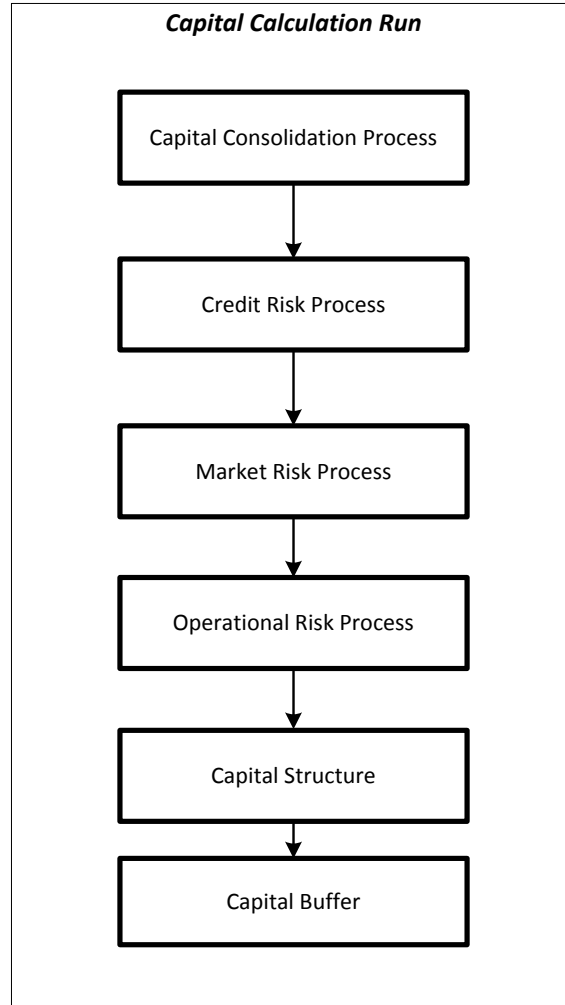
The following are not covered by the application in the computation of Credit Valuation Adjustment:

- Treatment of specific wrong way risk.
- Treatment of incurred CVA loss.

## 4.2.2 Changes in Indian Jurisdiction – Standardized Approach

### India - High Level Process Flow- Standardized Approach

#### Process Flow for Capital Adequacy Ratio Calculation



## Capital Calculation Run

The Capital Calculation Run depicted in the preceding process flow is a single run which is a joined together by multiple processes. Each process is a block, compiled together to form an entire Capital Adequacy run. The individual blocks like the Credit Risk process, Market Risk process, and so on, also exist as individual runs which is described in the following sections.

Capital Consolidation is a process common to each of the individual block when they are triggered separately as an individual run. For example: the standard out-of-box Market Risk run has Capital Consolidation and Market Risk process bundled together as a single Market Risk run. This is applicable for a Credit Risk run and Operational Risk run as well. The Capital Consolidation is explained in the following section and is not repeated under the Non Securitization process, Securitization process, Market Risk process, or Operational Risk section of this document.

In Capital Consolidation, the application processes the following:

### **Capital Consolidation Level Selection**

The reporting bank may be a part of a financial group that has multiple legal entities like parent or child entities (subsidiaries) under its name. The entity on which you are required to process should be selected by you. Subsequently, level at which a Run is to be executed (solo or consolidated) should also be selected. You can select these options in the Run Management UI. However, if the Run is executed in the Run Rule

Framework (RRF), then these options have to be set using the Rule '**Capital Consolidation Level Selection**' in the process '**IND\_BASELIII\_CAPITAL\_CONSOLIDATION**'.

'**IND\_BASELIII\_CAPITAL\_CONSOLIDATION**' is the first process to be added in all the Runs defined in the RRF except for the Staging Data Population Run. The Run Management UI selects this process by default.

### ***Run Parameters Assignment***

The Basel accord states different approaches for calculating RWA. The Run Management UI in the application allows the reporting bank to define and execute a Run by selecting a combination of different Basel II approaches for RWA computation.

Run Parameter Assignment is also part of **Capital Consolidation** process. The Rule '**Run Definition User Defined Run Param Assignment**' is used to assign the Run parameters if a Run is executed in the RRF. If the Run is executed from the Run Management UI, then the parameters are populated based on the Run defined in the Run Definition window.

### ***Currency Conversion***

The Rules pre-defined in the application performs currency conversion of all General Ledger amount attributes to be used for Capital Consolidation from the Natural currency to the Reporting currency, based on the exchange rate provided.

### ***Shareholding percent multiplication***

For all entities in the Capital Consolidation process, the application updates the shareholding percentage against each entity data in the fact capital accounting head from the fact entity shareholding percent table. 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 share holding percent table.

The exposure amount which is a part of the input data (product processors) is the exposure amount for a solo entity. However, in case of a consolidated Run, the parent exposure is considered only on the basis of shareholding percentage, based on the following calculation:

Exposure amount X share holding percent = Updated Exposure Amount

(Where share holding percent is allotted a value by the application during the process - Capital Consolidation in the Rule Cap Consl Effective Shareholding Percent for an Entity)

This assignment is performed by the Rule <Attribute > Shareholding Percent Multiplication. The following attributes undergo shareholding percent multiplication:

- Outstanding Principal
- Current Exposure Amount
- Undrawn Amount
- Exposure Market Value
- Exposure Accrued Interest
- Provision Amount
- Write Off Amount
- Original Book Balance Amount
- For OTC products, Notional Principal and Contract Amount undergo shareholding percent multiplication.



**Data Population:**

- Pre-processing steps:

Credit risk exposures' data needs to be loaded in the application for all the product types through their respective input tables known as product processors. The important categories of Credit Risk (CR) Non Securitization exposures, along with their respective table names, that are used for data input are as follows:

Product	Source
Bills	BILLS_EXPOSURE_DATA_CREATION
Credit Cards	CARDS_EXPOSURE_DATA_CREATION
Swaps	SWAPS_EXPOSURE_DATA_CREATION
Futures	FUT_EXPOSURE_DATA_CREATION
Guarantees	GRT_EXPOSURE_DATA_CREATION
Investments	INV_EXPOSURE_DATA_CREATION
Lease Contracts	LEASES_EXPOSURE_DATA_CREATION
Letters of Credit	LC_EXPOSURE_DATA_CREATION
Loans	LOAN_EXPOSURE_DATA_CREATION
Money market instruments	MM_EXPOSURE_DATA_CREATION
Overdraft	OD_EXPOSURE_DATA_CREATION
Options	OPT_EXPOSURE_DATA_CREATION
Re purchase contracts	REPO_EXPOSURE_DATA_CREATION
Equity Exposures	EQUITY_EXP_LP_DATA_POPULATION
Underlying exposures for repo contracts	UNDERLYING_EXPOSURES_DATA_POPULATION
Credit Derivatives	CREDIT_DERIVATIVES_DATA_POPULATION
Underlying equity for repo contracts	UNDERLYING_EQUITY_DATA_POPULATION
Placed Collateral	PLACED_COLLATERAL_PROCESSING_DATA_POPULATION
Portfolio Population	Portfolio_Population

- Processing steps:

Stage data from the product processors or other stage tables is populated in the required tables. All product processor data is populated in a common fact table for all Non Securitization exposures (**FCT\_NON\_SEC\_EXPOSURES**) except equity data.

Equity data related to equity and investment fund are stored in the respective equity exposures (**STG\_EQUITY\_EXPOSURES**) and fund equity investments table (**STG\_FUND\_EQUITY\_INVESTMENTS**). It is then populated in the respective fact tables for equity exposures. From here, the data is populated in the common fact table (**FCT\_NON\_SEC\_EXPOSURES**) for all Non Securitization exposures. For more information on the list of columns to be populated within each table, refer to the *Download Specifications* document.

## **Reclassification Process**

The sub processes for Reclassification Process are:

- Product Type Reclassification and
- Party Type Reclassification
- Rating Reclassification

The application reclassifies the bank's product types and party types to Basel standard product and party types. Based on standard Basel product and party type, it forms an asset class for each exposure. Equity is reclassified by the application in a separate Rule.

### ***Product Type Reclassification***

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the RBI Basel III guidelines. The product types after reclassification are stored as Basel product types.

### ***Party Type Reclassification***

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

RBI has different treatment for Domestic and Foreign entities for certain party types. The assignment for nonresident types is done based on country of incorporation. Hence when the country of incorporation of party is not same as the country of reporting entity then the same is reclassified as a Foreign/non-resident party.

### ***Rating Reclassification***

Data for credit ratings is uploaded in the application through the following ratings tables:

Accounts Rating Table (**STG\_ACCOUNT\_RATING\_DETAILS**):

This table stores ratings of all Credit Risk Non Securitized exposures except for Investment Exposures (present in **STG\_INVESTMENTS**), Securitized Exposures, and Securitized Tranches.

Instrument Rating Table (**STG\_INSTRUMENT\_RATING\_DETAILS**):

This table stores ratings for all Market Risk Exposures, Investment Exposures subject to Credit Risk (one that are in **STG\_INVESTMENTS**), and Mitigants.

Party Rating Table (**STG\_PARTY\_RATING\_DETAILS**):

This table stores credit rating information of all customers and issuers.

Sovereign Rating Table (**STG\_SOVEREIGN\_RATING\_DETAILS**):

This table stores credit rating for all countries.

#### **Processing Steps:**

Banks obtain credit ratings from different sources which need to be uploaded to the application through the four rating tables. The application re-classifies the rating information to standard Basel ratings.

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**Note:** In the **STG\_PARTY\_RATINGS\_DETAILS** table ensure that the following columns are mandatorily populated with data:

- Rating source code (**V\_RATING\_SRC\_CODE**)
  - Party Code (**V\_PARTY\_CD**)
  - Purpose (**V\_PURPOSE**): This field indicates whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.
  - Rating Code (**V\_RATING\_CODE**)
- 

The rating reclassification lookup table (**FSI\_RATING\_CLASSIFICATION**) is used to reclassify all the bank ratings to their Basel ratings. Ratings are populated from the stage tables to FSI tables using the lookup table to fetch reclassified rating.

Once the application identifies the reclassified ratings, risk weight Rules update the risk weights in the rating risk weight mapping table. Further, the multiple assessments Data Transformation update the rating and the risk weights to the exposures. For each exposure, the application checks the risk weight yielded by each of its ratings. It then assigns the second greatest risk weight and the rating that yields such risk weight to the exposure.

For unrated Non Securitized exposures, the application does an issuer assessment as per the RBI Basel III guidelines. This is done to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred 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.

RBI has approved following Domestic credit rating agencies – whose ratings may be used by banks for assigning risk weights for credit risk. The lists of agencies are:

- a. Brickwork Ratings India Pvt. Limited (Brickwork)
- b. Credit Analysis and Research Limited
- c. CRISIL Limited
- d. ICRA Limited
- e. India Ratings and Research Private Limited (India Ratings)
- f. SME Rating Agency of India Ltd., (SMERA).

The RBI has decided that banks may use the ratings of the following International Credit rating agencies

- a. Fitch
- b. Moody's
- c. Standard & Poor's.

An example for Long Term rating is shown in the below table:

CARE	CRISIL	India Ratings and Research Private Limited (India Ratings)	ICRA	Brickwork	SME Rating Agency of India Ltd. (SMERA)	RBI Basel Equivalent
CARE AAA	CRISIL AAA	IND AAA	ICRA AAA	Brickwork AAA	SMERA AAA	AAA Equivalent
CARE AA	CRISIL AA	IND AA	ICRA AA	Brickwork AA	SMERA AA	AA Equivalent
CARE A	CRISIL A	IND A	ICRA A	Brickwork A	SMERA A	A Equivalent
CARE BBB	CRISIL BBB	IND BBB	ICRA BBB	Brickwork BBB	SMERA BBB	BBB Equivalent
CARE BB, ,	CRISIL BB, ,	IND BB, ,	ICRA BB, ,	Brickwork BB, ,	SMERA BB, ,	BB Equivalent
CARE B	CRISIL B	IND B	ICRA B	Brickwork B	SMERA B	B Equivalent
CARE C & CARE D	CRISIL C & CRISIL D	IND C & IND D	ICRA C & ICRA D	Brickwork C & Brickwork D	SMERA C & SMERA D	Lower B Equivalent
Unrated	Unrated	Unrated	Unrated	Unrated	Unrated	Unrated

Where “+” or “-” notation is attached to the rating, the corresponding main rating category risk weight is used.

An example for Short Term Rating is shown in the below table:

CARE	CRISIL	India Ratings and Research Private Limited (India Ratings)	ICRA	Brickwork	SME Rating Agency of India Ltd. (SMERA)	RBI Basel Equivalent
CARE A1+	CRISIL A1+	IND A1+	ICRA A1+	Brickwork A1+	SMERA A1+	A1+ Equivalent
CARE A1	CRISIL A1	IND A1	ICRA A1	Brickwork A1	SMERA A1	A-1 Equivalent
CARE A2	CRISIL A2	IND A2	ICRA A2	Brickwork A2	SMERA A2	A-2 Equivalent
CARE A3	CRISIL A3	IND A3	ICRA A3	Brickwork A3	SMERA A3	A-3 Equivalent
CARE A4 & D	CRISIL A4 & D	IND A4 & D	ICRA A4 & D	Brickwork A4 & D	SMERA A4 & D	Lower A-3 Equivalent
Unrated	Unrated	Unrated	Unrated	Unrated	Unrated	Unrated

Where “+” or “-” notation is attached to the rating, the corresponding main rating category risk weight is used.

### **Mitigant Data Population and Eligibility process**

The sub processes are as follows:

- Mitigant Reclassification
- Mitigant RW Assignment
- Mitigant Eligibility
- Mitigant Volatility Haircut Assignment

### ***Mitigant Reclassification***

For mitigants the application reclassifies the mitigant type to the standard mitigant type like the debt securities, credit derivative, cash, and so on. Reclassification mitigant type is used for downstream processing like multi eligibility, multi risk weight assignment and so on.

As per RBI guidelines, since equity is ineligible, equity Mitigant type is mapped to “Others” as standard mitigant type.

### ***Mitigant RW Assignment***

To apply risk weight to the covered portion, the risk weight is mapped to the protection provider (Guarantor) based on Standard Party Type and Basel Rating of the guarantor. It is then, taken to mitigant level.

Mitigant RW is assigned based on Credit rating and Standard Party class, for the guarantee provided by following standard parties:

- Foreign Sovereign
- NBFC-Infrastructure Finance Companies
- Non-deposit Taking Systemically Important NBFC
- NBFC-Infrastructure Development Fund
- NBFC-Others
- Corporate Non SME
- Primary Dealers
- Domestic PSEs"
- Asset Finance Companies
- Non Resident Corporate
- Foreign PSE
- Multilateral development Bank

A rule “IND BASEL III - Mitigant RW Assignment” is created. For the guarantee provided by the Banks incorporated in India and Foreign Bank branches in India, a rule “IND BASEL III Mitigant RW Assignment - Banks” is created. It assigns RW based on Standard Party Type, Country and CET1 band. Country refers to the Country of operation of the guarantor bank. This is executed after “IND BASEL III - Mitigant RW Assignment” rule, as there is a difference in treatment for the guarantee provided by the Foreign Banks branches in India.

For the guarantee provided by domestic sovereigns, the rule “IND Mitigant RW Assignment for Domestic Sovereign” is used for claims on domestic sovereign.

Though, there is no risk weight applied to the portion covered by eligible financial collateral, from the solution perspective, a 0% RW is assigned to such portion. This is to ensure that the post haircut collateral amount is deducted from the exposure amount. The BIS rule “Mitigant RW Assignment for Financial Collaterals” and

“Basel II Mitigant RW Assignment for Nettable Liabilities” is used for this. It is executed after all other RW assignment rules.

Mitigant RW assignment is dependent on design of exposure RW assignment and mapping of standard party class, rating to the risk weight as mentioned in the exposure RW assignment rules.

The party rating considered for RW assignment should be current and not original. Therefore, if a rating needs to be considered as eligible rating for RW assignment as on MIS date, then the F\_ORIGINAL\_CREDIT\_RATING\_IND in party rating detail should be 'N'.

### ***Mitigant Eligibility***

Mitigant type is considered to determine whether the mitigant is eligible for a particular exposure or not. There are separate eligibility Rules for mitigant types that are mutual funds, or debt security. 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 1 year and residual maturity is more than 3 months.

### **Eligible Collateral**

Banks, which take eligible financial collateral, can reduce the exposure amount to counterparty when calculating their capital requirements to take account of the risk mitigating effect of the collateral. The application has Rules that carry out the eligibility checks.

Following are the eligible financial collateral as per RBI Basel III guidelines:

- (i) Cash (as well as certificates of deposit or comparable instruments, including fixed deposit receipts, issued by the lending bank) on deposit with the bank which is incurring the counterparty exposure.
- (ii) Gold: Gold would include both bullion and Jewellery. However, the value of the collateralized Jewellery is arrived at after notionally converting these to 99.99 purity.
- (iii) Securities issued by Central and State Governments
- (iv) Kisan Vikas Patra and National Savings Certificates provides no lock-in period. It is operational and they can be encashed within the holding period.
- (v) Life insurance policies with a declared surrender value of an insurance company which is regulated by an insurance sector regulator.
- (vi) Debt securities rated by a chosen Credit Rating Agency in respect of which banks is sufficiently confident about the market liquidity where these are either:
  - (a) Attracting 100 per cent or lesser risk weight that is, rated at least BBB(-) when issued by public sector entities and other entities (including banks and Primary Dealers); or
  - (b) Attracting 100 per cent or lesser risk weight that is, rated at least CARE A3/ CRISIL A3/ India Ratings and Research Private Limited (India Ratings) A3/ICRA A3/Brickwork A3/ SMERA A3 for short-term debt instruments.
- (vii) Debt Securities not rated by a chosen Credit Rating Agency in respect of which banks is sufficiently confident about the market liquidity where these are:
  - (a) Issued by a bank
  - (b) Listed on a recognized exchange
  - (c) Classified as senior debt
  - (d) all rated issues of the same seniority by the issuing bank are rated at least BBB(-) or CARE A3/ CRISIL A3/ India Ratings and Research Private Limited (India Ratings) A3/ICRA A3/Brickwork A3/SMERA A3 by a chosen Credit Rating Agency

(e) the bank holding the securities as collateral has no information to suggest that the issue justifies a rating below BBB(-) or CARE A3/ CRISIL A3/ India Ratings and Research Private Limited (India Ratings) A3/ICRA A3/Brickwork A3/SMERA A3 (as applicable)

(f) Banks is sufficiently confident about the market liquidity of the security.

(viii) Units of Mutual Funds regulated by the securities regulator of the jurisdiction of the bank's operation mutual funds where:

(a) A price for the units is publicly quoted daily that is, where the daily NAV is available in public domain

(b) Mutual fund is limited to investing in the instruments listed in this paragraph.

Re-securitizations, irrespective of any credit ratings, are not eligible financial collateral.

### *Eligible Guarantor*

As per the RBI Basel III guidelines, the following guarantors are considered eligible:

1. Sovereigns and sovereign entities. This includes BIS, IMF, European Central Bank and European Community and other eligible MDBs, ECGC, CGTSI, CRGFTLIH, banks and primary dealers with a lower risk weight. The following MDB are treated as an eligible guarantor:
  - (a) World Bank Group: IBRD and IFC
  - (b) Asian Development Bank
  - (c) African Development Bank
  - (d) European Bank for Reconstruction and Development
  - (e) Inter-American Development Bank
  - (f) European Investment Bank
  - (g) European Investment Fund
  - (h) Nordic Investment Bank
  - (i) Caribbean Development Bank
  - (j) Islamic Development Bank
  - (k) Council of Europe Development Bank
  - (l) International Finance facility for Immunization
2. Other entities that are externally rated, including credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor. The exception to this requirement is when credit protection is provided to a securitization exposure.
3. When credit protection is provided to a securitization exposure, other entities that are currently externally rated BBB- or better AND that were externally rated A- or better at the time the credit protection was provided. This includes credit protection provided by parent, subsidiary, and affiliate companies when they have a lower risk weight than the obligor.

Mitigant eligibility is not present if, exposure guarantor is positively correlated with credit protection as main business indicator (standard party type). Similarly, mitigant eligibility is present if, exposure guarantor is positively not correlated with credit protection as main business indicator (standard party type).

Mitigant eligibility is not present if, exposure guarantor is positively correlated with credit protection as main business indicator (special purpose entity).

Mitigant eligibility is present if, exposure guarantor is positively not correlated with credit protection as main business indicator (insurance entity).

### ***Data Expectation***

Security under lock-in period”: Value ‘can be Y’ or ‘N’; ‘Y’ in this column is to identify whether the mitigant is currently under lock-in period and cannot be liquidated.

The requirements regarding Life Insurance are operational in nature and it is expected that the bank will fulfill such operational requirement before passing data of Life Insurance as financial Collateral.

Unrated Debt Security Eligibility hierarchy (underlying column F\_UNRATED\_DEBT\_SEC\_ELIG\_FLAG) -The value in this flag should be Y if all the eligibility condition of unrated debt as financial collateral, as mentioned in para 7.3.5 (vii) (a) to (vii) (f) of RBI Basel III Master Circular are satisfied. That is, including securities issued by the bank.

The value in “Eligible Mutual Fund Indicator” which is based on f\_elig\_mutual\_fund\_ind, is expected to be Y if all the eligibility conditions of Mutual Fund as an eligible financial collateral, as mentioned in para 7.3.5 (viii) of RBI Basel III Master circular is satisfied.

### ***Mitigant Haircut Assignment:***

The application performs computations for volatility mitigant haircut. Volatility haircuts are calculated and amount of the exposure to the counterparty and the value of collateral or mitigants, is adjusted to account for any future fluctuations in the market value. After the adjustment, the application provides the volatility adjusted amounts for both exposures (higher than original exposure amount) and collateral (lower than original amount).

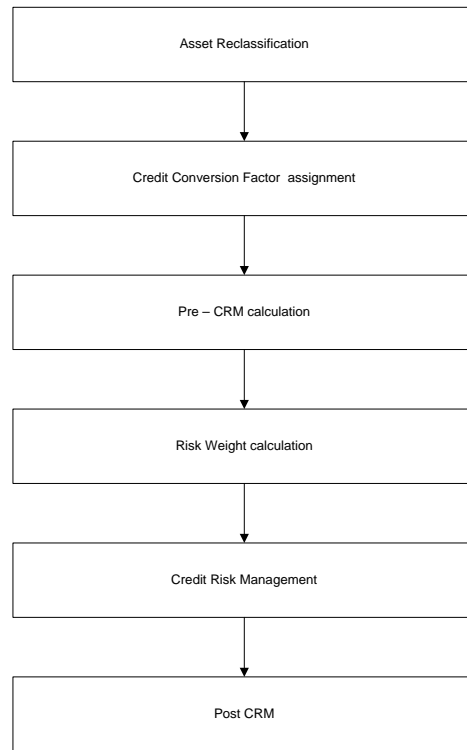
The volatility haircut is assigned based on Supervisory haircut as per RBI Basel III guidelines:

In Supervisory Haircut method, the application assigns volatility haircut based on issuers, issuer’s ratings, mitigants residual maturity, and type of mitigant. The assignment is done as per RBI guidelines. The haircut is scaled up based on the minimum holding period for the transaction type where applicable.

## **Credit Risk Non Sec Process**



The sub processes are as follows:



### ***Asset Class Reclassification***

On the basis of 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 rule is split as follows:

- Initially the rule assigns asset class based on standard counterparty type alone. This is because, the majority of asset classes are based on party type alone like Sovereign, MDB and so on. Example: IND - Basel III Non Sec Asset Class Reclassification is based on Standard Counterparty Type – STD.
- The rule then assigns asset class based on combination of standard party types and standard product types. Only relevant combinations are selected. This is done to keep the rule size manageable. Example: IND - Basel III Non Sec Asset Class Reclassification – STD.
- A set of rules assigns asset class for specific scenario where any additional information other than standard party type or standard product types is also needed. Example: IND - Basel III Non Sec Asset Class Reclassification - Loans and Advances to Staff, IND Asset Class reclassification - Domestic Sovereign Exposures for CGTMSE, CRGFTLIH and so on.
- The rule assigns the effective asset class as part of CRM for unfunded protections. This rule is similar to the first set, except that exposures guaranteed by State Government and Central Government are classified into separate asset class and not under 'Domestic Sovereign'. Example: IND - Basel III CRM Effective Asset Class Reclassification – STD.

For example: When standard counterparty is a corporate, the asset class is corporate, except when exposure has specific product types like mortgages where the asset class may be Claims secured by commercial mortgages and so on.

In addition to the above asset class reclassification process for exposures, to ensure it follows the regulatory retail portfolio definition as specified in the Master Circular the following process is followed:

MAP\_RET\_EXP works based on fct\_non\_sec\_exposures table; particularly on columns like Basel Asset Class, Customer/Issuer, Standard Counterparty type, Basel Product Type, and so on.

This DT checks the Qualifying Criteria requirement of para 5.9.3 of Master Circular – Basel III Capital Regulations in terms of Orientation Criterion, Low value of individual exposures and Granularity Criterion. Product Criterion and customer as Individual etc is addressed through reclassification. It assigns Regulatory Retail Portfolio asset class for exposure's to bank's own staff not backed by Superannuation adjustment benefits and as defined in para 5.14.2 of Master Circular – Basel III Capital Regulations.

Post that, it checks the orientation criteria for average turnover of the party against 50 cr and accordingly updates asset class. It, then, checks whether the aggregated exposure to one counterparty exceeds threshold limit of Rs 5 cr then based on customer type it updates asset class to either Corporate, Regulatory Retail or others. Granularity check is performed at the end to check whether total exposure to one counterparty is greater than Granularity threshold (0.2%) of total Regulatory Retail Portfolio. In that case, based on customer type it updates asset class to either Corporate, Regulatory Retail or others. It excludes NPAs from the overall regulatory retail portfolio.

Credit Conversion Factor (CCF):

CCF is applied to all the off balance sheet exposures. The CCF applied values are 0, 0.2, 0.5, and 1. The various factors on the basis of which the CCF is applied are product type, type of facility (whether it is cancellable or not), and the maturity of the exposure.

As per the RBI Basel III guidelines for Standardized Approach following are the CCF assigned to off-balance sheet items:

<b>Credit Conversion Factors – Non-market related Off-Balance Sheet Items</b>	
<b>Instruments</b>	<b>Credit Conversion Factor (%)</b>
Direct credit substitutes	100
Certain transaction-related contingent items	50
Short-term self-liquidating trade letters of credit arising from the movement of goods	20
Sale and repurchase agreement and asset sales with recourse	100
Forward asset purchases	100
Unpaid part of partly paid shares and securities	100
forward deposits	100
Note issuance facilities	50
Revolving / non-revolving underwriting facilities	50
Unconditional take-out finance	100
Conditional take-out finance	50
Lending of banks' securities or posting of securities as collateral by banks	100
Commitments with certain drawdown	100
Commitments unconditionally cancellable	0
Other commitments Maturity up to 1 year	20
Other commitments Maturity more than 1 year	50

### ***Pre CRM EAD***

Pre-CRM Exposure at Default (EAD): Exposure at Default is calculated for all asset classes based on:

- Current Exposure Amount
- Off-Balance Sheet Drawn CCF Percent
- Provision Amount
- Undrawn Amount

- CCF Percent
- Exposure Accrued Interest
- Write Off Amount

If the reporting bank has an exposure to one of its own subsidiaries, then that exposure is classified as an internal exposure. Each of the internal transactions, that is, transaction between the parent and its subsidiary, is marked as a deduction line item. The deduction is processed as part of the capital structure processing and all the internal transactions are eliminated from any RWA calculation.

Of the total exposure amount, the exposures may have drawn amount and undrawn amount. The drawn amount is the direct credit exposure and undrawn amount may become a future exposure when that amount is drawn. Therefore, EAD related to undrawn amount is calculated by multiplying the CCF percent with undrawn amount. The application calculates the EAD related to drawn amount using:

- Exposure Accrued Interest
- Off-Balance Sheet Drawn CCF Percent
- Write Off Amount
- Provision Amount
- Current Exposure Amount

- **Currency Conversion:**

In this, the application converts data columns (represented as amount) that are in the natural currency, to reporting currency columns which are used for any further calculations. The column names suffixed as ‘\_ncy’ are in the natural currency and are multiplied by the Currency Conversion Factor to populate values in the reporting currency. The Rule **IND - Reporting Currency Code Assignment** is used to assign the reporting currency in case of a Run Rule Framework (RRF) execution.

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**NOTE:** The Rule **IND - Reporting Currency Code Assignment** is set to ‘INR’. However, you can modify the reporting currency according to your requirements. You can select the reporting currency in the above mentioned rule, if the Run is executed from the Run Execution screen.

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### *Risk Weight*

#### Sovereign

The RBI guidelines, under Claims on Domestic Sovereigns, have listed out the different Risk Weights applicable for different domestic sovereign claims of a Bank.

- a. Any claim of the Bank to Central Government gets zero percent risk weight. A bank which invests in State Government or any loan, credit or overdraft exposure to the State Government gets a zero percent Risk Weight.
- b. Any Claims on Reserve Bank of India (RBI), Deposit Insurance and Credit Guarantee Corporation (DICGC), Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), Credit Risk Guarantee Fund Trust for Low Income Housing (CRGFTLIH) are regarded as claims on Central government and gets a zero percent Risk Weight. Any claim on Export Credit Guarantee Corporation of India Ltd. (ECGC) attracts a 20 percent Risk Weight.
- c. Any claim on Central Government or State Government has a Risk Weights applicable only if the asset has been identified as Standard or Performing. If the Asset is recognized as Non Performing Asset (NPA), they will get the Risk Weight as detailed under the section ‘Non-Performing Assets’ in RBI guidelines.

- d. All outstanding amounts covered under any Debt Waiver Schemes announced by government of India, such as Agricultural Debt Waiver Scheme will be treated as outstanding debt and gets a zero percent Risk Weight.
- e. The Claims guaranteed by State Government gets 20 Percent Risk weight.
- f. Central Government guaranteed claims will attract a zero risk weight.

#### Claims on Foreign Sovereigns

The International Rating Agencies S&P, Fitch & Moody's, assigns Risk Weights of the Foreign Sovereign claims. Irrespective of the currency in which these are funded gets Risk Weights as determined by the Rating agencies.

If a claim on a foreign sovereign is funded in the same currency as of the sovereign then it gets zero percent Risk Weight irrespective of its Ratings.

The requirements prescribed by Host Country supervisors will be applicable to claims in the books of the foreign branches of the Indian banks for computing capital adequacy.

If the Indian Bank has claims to the Foreign Sovereigns in the books of the foreign branches where the supervisor requires more conservative treatment then they should adopt the requirements prescribed by the Foreign Country Supervisor.

#### Claims on Corporate and Primary Dealers:

Claims on Primary Dealers is reported separately (not under Claims on Corporates) under the RBI RCA3 reporting requirements. Hence these are assigned under the existing asset class 'Primary Dealers'.

- a. Any Claims on Corporate, Asset Finance Corporations (AFC), Non-Banking Finance Companies - Infrastructure Finance Companies is Risk Weighted as per the Rating Agencies which are registered with SEBI. The Ratings are reclassified as per Basel Credit Ratings. The Short Claims and Long Term claims are rated differently.
- b. Any claims on AFCs which attract 150 percent Risk Weight reduces to 100 percent.
- c. For entities/counterparties whose obligations are restructured or re-scheduled, the unrated claims on these entities attracts 125 percent Risk Weight.
- d. For Claims on corporate which are unrated, the risk weight assigned does not preferential to that assigned to its sovereign of Incorporation.

Unrated claims to Corporate, where the aggregated exposure to a single counterparty is more than the threshold limit of Rs 10 crore will be risk weighted at 150%.

Looking at the above it is implied that RBI defined a threshold limit of Rs 10 crore for aggregate exposure on a single counterparty to determine that a RW of 150% applies to Unrated claims.

The RCA3 reporting template requires the Unrated claims above threshold limit and Risk weighted at 150% is reported as a separate row. Hence it is assumed that the threshold limit logic for unrated claims applies under the RBI Basel III requirements as well.

In RCA3 report "Mkt risk Specific-CDS" for RBI, Part A Specific Risk Charge does not reflect the impact of hedging for CDS. Part B Specific Risk Charge which is reported counterparty-wise has hedging benefit reflected in the values.

#### Assumption:

As per the Para 5.8.2 of RBI Basel III guidelines (2013), RBI may warrant a standard risk weight higher than 100% to unrated corporate claims. Further para 5.8.2 of the RBI New Capital Adequacy Framework (2007) mentions that With effect from April 1, 2009, all fresh sanctions or renewals in respect of unrated claims on corporate in excess of Rs. 10 crore threshold (with reference to the aggregate exposure on a single counterparty for the bank as a whole) will attract a risk weight of 150%.

Since the RCA3 reporting template requires the Unrated claims above threshold limit and Risk weighted at 150% to be reported as a separate row, it is assumed that the threshold limit logic as defined under the 2007 RBI Basel II guidelines for unrated claims applies under the RBI Basel III requirements as well.

Risk weights for Claims on Non-Resident Corporates.

### Bank

An RBI Basel III guideline requires calculating RWA for claims on banks, that is, exposure in capital instruments of other banks.

Claims on Banks in India and Branches of foreign Banks in India, are treated based on following major criteria.

(i) Investments in capital instruments of banks where the investing bank holds not more than 10% of the investee bank.

Aggregate of these investments, together with investments in capital instruments in insurance and other financial entities do not exceed 10% of common equity of the investing bank.

(ii) Equity investments in other banks where the investing bank holds more than 10% of the issued common shares of the investee banks.

Aggregate of these investments, together with investments in capital instruments in insurance and other financial entities do not exceed 10% of common equity of the investing bank.

The applicable treatment is as follows:

Risk Weights (%)						
All Scheduled Banks (Commercial, Regional Rural Banks, Local Area Banks and Co-Operative Banks)				All Non-Scheduled Banks (Commercial, Regional Rural Banks, Local Area Banks and Co-Operative Banks )		
Level of Common Equity Tier 1 capital (CET1) including applicable capital conservation buffer (CCB) (%) of the investee bank (where applicable)	Investments referred to in paragraph (i)	Investments referred to in paragraph (ii)	All other claims	Investments referred to in paragraph (i)	Investments referred to in paragraph (ii)	All Other Claims
1	2	3	4	5	6	7
Applicable Minimum CET1 + Applicable CCB and above	125 % or the risk weight as per the rating of the instrument or counterparty, whichever is higher	250	20	125% or the risk weight as per the rating of the instrument or counterparty, whichever is higher	300	100
Applicable Minimum CET1 + CCB = 75% and <100% of applicable CCB35	150	300	50	250	350	150
Applicable Minimum CET1 + CCB = 50% and <75% of applicable CCB	250	350	100	350	450	250

Applicable Minimum CET1 + CCB = 0% and <50% of applicable CCB	350	450	150	625	Full deduction*	350
Minimum CET1 less than applicable minimum	625	Full deduction*	625	Full deduction*	Full deduction*	625

The entire exposure is handled assuming it is less than 10% of Banks own equity. During the Capital structures run, depending upon value of F\_SIGNIFICANT\_INVESTMENT\_IND, the investment above 10% and below 10% gets divided – the below 10% is risk weighted proportionately and above 10% is moved to deductions.

In case of banks where no capital adequacy norms are prescribed by the RBI, the lending / investing bank calculates the CRAR of the cooperative bank concerned, notionally, by obtaining necessary information from the investee bank, using the capital adequacy norms as applicable to the commercial banks.

In case, it is not feasible to compute CRAR on such notional basis, the risk weight of 350 or 625 per cent, as per the risk perception of the investing bank, is applied uniformly to the investing bank's entire exposure.

Above mentioned treatment is handled through a set of rules.

RW Assignment mentioned in above table is handled through:

- IND - Basel III Non Sec Pre-mitigation UL for Claims on Banks Other Than Capital Invst Exp – STD
- IND - Basel III Non Sec Pre-mitigation RW UL For Capital Investments - Claims On Banks - STD
- IND - Basel III Non sec Pre-mitigation RW UL for claims on Banks – Cap Invest on Inst Ratings – STD
- IND-Basel III Non sec Pre-mitigation RW UL for claims on Banks capt invst based on Cust ratings-STD

Treatments based on other conditions are handled through:

- IND - Basel III Non Sec Pre-mitigation RW UL for Claims on Bank – STD
- IND - Basel III Non sec Pre-mitigation RW UL for claims on Banks based on risk perception – STD
- IND - Basel III Non sec Deduction for Claims on Banks Invst within 10percent - STD

#### Claims on Foreign Banks

Claims on Foreign banks are risk weighted based on ratings assigned by international agencies.

The claims on a bank which are denominated in 'domestic' foreign currency met out of the resources in the same currency raised in that jurisdiction will be risk weighted at 20 per cent provided the bank complies with the minimum CRAR prescribed by the concerned bank regulator(s).

Rule “IND - Basel III Non Sec Pre-mitigation UL for Claims on Foreign Banks” assigns RW according to rating and based on difference in funded and denominated currency.

Also, in case a Host Supervisor requires a more conservative treatment for such claims in the books of the foreign branches of the Indian banks, they should adopt the requirements prescribed by the Host supervisor for computing capital adequacy. i.e if the applicable host country risk

weight is more, then max of the host country supervisory risk weight and risk weight calculated by RBI has to be applied to the exposure.

This is done through rule “IND - Basel III Non Sec Pre mitigation RW UL - Host Regulator RW treatment – STD”. Depending upon treatment prescribed by host supervisor, this rule is expected to be updated during implementation.

As per the Accord in Page- 37, “The exposures of the Indian branches of foreign banks, guaranteed / counter-guaranteed by the overseas Head Offices or the bank’s branch in another country would amount to a claim on the parent foreign bank and would also attract the risk weights as per Table 5 above.”

## Corporate

### ***Risk weighting of Claims to Primary Dealers and Claims on Corporates, NBFC-IFCs and AFCs based on ratings:***

RWs are assigned for long term rating in existing rule ‘IND Non Sec Pre-Mitigation RW UL – STD’ under sub-process ‘Non Sec STD RW Assignment’. This rule assigns RWs for Non Resident Corporates, Primary Dealers & Corporate Non SME Non SL asset classes along with other asset classes.

The RWs assignment based on Short term ratings are handled in existing rule ‘IND Non Sec Pre-Mitigation RW UL for Banks and Corporates’. In the Rule, the Corporates are identified in the Basel Asset Class and the Original Maturity for CCF Assignment has ‘Maturity is less than or equal to one year’ to identify if it is short term claim.

### ***Risk weight capping for exposures to AFCs:***

All exposures to AFCs where the RW is more than 100% are reduced to 100%. A rule ‘**IND - Basel III Non Sec Pre-Mitigation RW UL Floor for AFCs**’ is created. This rule has Basel Asset Class as ‘Corporate Non SME Non SL’ and Standard Party Type as ‘Asset Finance Companies’ and cap the RW set in the previous RW rules based on ratings to 100% (parameterized) using a business processor.

### ***Unrated exposure to entities whose obligations have been re-structured/re-scheduling:***

The unrated claims on Entities whose obligations are re-structured/re-scheduling is assigned 125% Risk Weight until satisfactory performance under revised payment schedule has been established for one year from the date when the first payment of interest falls due under the revised schedule.

In order to handle this requirement, identify the exposures which are restructured and capture the first payment date under revised schedule. Since obligation subject to restructuring /rescheduling are mostly loans, these attributes are expected only on the Stage Loans Contracts table.

Two hierarchies are created which is used to risk weight unrated restructured exposures to corporate entities:

1. Restructured Obligation Indicator
  - a. Restructured Obligation (when restructured indicator is Y)
  - b. Non-Restructured Obligation (catch all node)
2. Satisfactory Performance Period
  - a. Satisfactory Performance - Less than One year (Past Due Flag is N and difference between First Payment date under Revised Schedule and Mis Date is less than 1 year)



- b. Satisfactory Performance - More than One year (Past Due Flag is N and difference between First Payment date under Revised Schedule and Mis Date is more than 1 year)
- c. OTHERS (catch all node)

Claims on Primary dealers are treated as claims on Corporate.

***Risk weighting of Claims to Primary Dealers and Claims on Corporates, NBFC-IFCs and AFCs based on ratings:***

RWs are assigned for long term rating in existing rule 'IND Non Sec Pre-Mitigation RW UL – STD' under sub-process 'Non Sec STD RW Assignment'. This rule assigns RWs for Non Resident Corporates, Primary Dealers & Corporate Non SME Non SL asset classes along with other asset classes.

The RWs assignment based on Short term ratings are handled in existing rule 'IND Non Sec Pre-Mitigation RW UL for Banks and Corporates'. In the Rule, the Corporates are identified in the Basel Asset Class and the Original Maturity for CCF Assignment has 'Maturity is less than or equal to one year' to identify if it is short term claim."

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**NOTE:** "Multiple\_Assmt\_NonSec" is assigning risk weights based on short and long term ratings.

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Claims secured by Residential Property

Any lending made to any individuals meant for acquiring residential property which are fully secured by mortgages on residential property shall be risk weighted. This is indicated in the below table.

Category of Loan	LTV Ratio (%)	Risk Weight (%)
(a) Individual Housing Loans		
(i) Up to Rs. 20 lakh	90	50
(ii) Above Rs. 20 lakh and up to Rs. 75 lakh	80	50
(iii) Above Rs.75 lakh	75	75
(b) Commercial Real Estate – Residential Housing (CRE-RH)	N/A	75
(c) Commercial Real Estate (CRE)	N/A	100

- a. LTV ratio is computed as a percentage with total outstanding in the account ( "principal + accrued interest + other charges pertaining to the loan" without any netting) in the numerator and the realizable value of the residential property mortgaged to the bank in the denominator.
- b. Calculating Risk Weights for claims secured by residential property as per the above table: Also the LTV ratio should not exceed the prescribed ceiling in all fresh cases of sanction. In case the LTV ratio is currently above the ceiling prescribed for any reasons, efforts shall be made to bring it within limits.
- c. Restructured housing loans are risk weighted with an additional risk weight of 25% to the risk weights prescribed above.

- d. Banks exposure to third dwelling unit onwards to an individual is treated as CRE exposures.
- e. All other claims secured by residential property attract the higher of the risk weight applicable to the counterparty or to the purpose for which the bank has extended finance.
- f. Loans / exposures to intermediaries for on-lending is not eligible for inclusion under claims secured by residential property but is treated as claims on Corporate or claims included in the regulatory retail portfolio as the case may be.
- g. Investments in mortgage backed securities (MBS) backed by exposures as at paragraph 5.10.1 above is governed by the guidelines pertaining to securitization exposures.

#### **Restructured Indicator**

In order to capture the restructured Loans, the Hierarchy 'Restructured Indicator' is included in the rule for Risk Weight Assignment for claims secured by Residential Property. Rule 'IND - BASEL III Non Sec Claims Secured by Residential Property RW Assignment' is used.

#### Claims Classified as Commercial Real Estate

Real Estate is generally defined as an immovable asset - land (earth space) and the permanently attached improvements to it. Income-producing real estate (IPRE) has been defined in paragraph 226 of the Basel-II Framework.

Claims classified as commercial Real Estate attracts a risk weight of 100%.

The rule 'IND - Basel III Non Sec Pre-Mitigation RW UL – STD' takes care of this requirement, where the Basel II Asset Class Hierarchy will identify 'Claims on Commercial Real Estates' and assign 100 percent risk weight to target BP, 'BP - Non Sec Pre-Mitigation RW UL for Unrated Exposures'.

As per the RBI circular, CRE-Residential Housing is as sub-sector of Commercial Real Estate (CRE) and attracts a risk weight of 75%.

#### Specified Categories:

The fund based and non-fund based claims on Venture Capital Funds, attracts a higher risk weight of 150%.

The consumer credit, including personal loans and credit card receivables but excluding educational loans, attracts a higher risk weight of 125% or higher, if warranted by the external rating (or, the lack of it) of the counterparty. As gold and gold jewellery are eligible financial collateral, the counterparty exposure in respect of personal loans secured by gold and gold jewellery is worked out under the comprehensive approach as per paragraph 7.3.4. The 'exposure value after risk mitigation' attracts the risk weight of 125%.

Advances classified as 'Capital market exposures' attracts a 125% risk weight or risk weight warranted by external rating (or lack of it) of the counterparty, whichever is higher.

#### ***Risk Weight Application to capital instruments:***

- a. The exposure to **capital instruments** issued by NBFCs which are not deducted and are required to be risk weighted in terms of paragraph 4.4.9.2(B) is risk weighted at 125% or as per the external ratings, whichever is higher.
- b. The claims on rated as well as unrated 'Non-deposit Taking Systemically Important Non-Banking Financial Companies (NBFC-ND-SI), other than AFCs, NBFC-IFCs and NBFC-IDF, regardless of the amount of claim, shall be uniformly risk weighted at 100%.
- c. The exposure to capital instruments issued by financial entities (other than banks and NBFCs) which are not deducted and are required to be risk weighted in terms of paragraph 4.4.9.2(B) would be risk weighted at 125% or as per the external ratings whichever is higher.

***Risk Weight Application to equity instruments:***

- a. The exposure to equity instruments issued by NBFCs which are not deducted and are required to be risk weighted in terms of paragraph 4.4.9.2(C) would be risk weighted at 250%.
- b. All investments in the paid-up equity of non-financial entities (other than subsidiaries)
  - (i) Which exceed 10% of the issued common share capital of the issuing entity or where the entity is an unconsolidated affiliate as defined in paragraph 4.4.9.2(C)(i) receives a risk weight of 1111%.
  - (ii) Equity investments equal to or below 10% paid-up equity of such investee companies is assigned a 125% risk weight or the risk weight as warranted by rating or lack of it, whichever higher.
- c. The exposure to equity instruments issued by financial entities (other than banks and NBFCs) which are not deducted and are required to be risk weighted in terms of paragraph 4.4.9.2(C) is risk weighted at 250%.

**MDB's**

As per the RBI Basel III guidelines, the following guarantors are considered eligible:

1. Sovereigns and sovereign entities. This includes BIS, IMF, European Central Bank and European Community and other eligible MDBs, ECGC, CGTSI, CRGFTLIH, banks and primary dealers with a lower risk weight. The following MDB are treated as an eligible guarantor:
  - (a) World Bank Group: IBRD and IFC
  - (b) Asian Development Bank
  - (c) African Development Bank
  - (d) European Bank for Reconstruction and Development
  - (e) Inter-American Development Bank
  - (f) European Investment Bank
  - (g) European Investment Fund
  - (h) Nordic Investment Bank
  - (i) Caribbean Development Bank
  - (j) Islamic Development Bank
  - (k) Council of Europe Development Bank
2. Other entities that are externally rated, including credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor. The exception to this requirement is when credit protection is provided to a securitization exposure.
3. When credit protection is provided to a securitization exposure, other entities that are currently externally rated BBB- or better AND that were externally rated A- or better at the time the credit protection was provided. This includes credit protection provided by parent, subsidiary, and affiliate companies when they have a lower risk weight than the obligor.

These are reclassified as MDB and risk weighted at flat 20%.

**Claims on PSE's**

All domestic PSE's are handled similar to Claims and Corporate.

Domestic PSE:

The claims on domestic PSEs are risk weighted in a manner similar to claims on corporate. Refer section associated with RW assignment to corporate

Foreign PSE:

The Claims on foreign PSEs will be risk weighted as per the rating assigned by the international rating agencies.

The risk weights for Foreign PSE's are given as follows-

Claims on Foreign PSEs – Risk Weights S&P/ Fitch ratings	AAA to AA	A	BBB to BB	Below BB	Unrated
Moody's ratings	Aaa to Aa	A	Baa to Ba	Below Ba	Unrated
RW (%)	20	50	100	150	100

The rule “IND – BASEL III Non Sec Pre-Mitigation RW UL – STD” assigns RW accordingly.

#### Retail and others:

The claims (including both fund-based and non-fund based) that meet all the four criteria listed below is considered as retail claims for regulatory capital purposes and included in a regulatory retail portfolio. Claims included in this portfolio are assigned a risk-weight of 75 per cent.

#### **Qualifying Criteria**

(i) **Orientation Criterion** - The exposure (both fund-based and non fund-based) is to an individual person or persons or to a small business; Person under this clause would mean that, any legal person capable of entering into contracts and would include but not be restricted to individual, HUF, partnership firm, trust, private limited companies, public limited companies, co-operative societies and so on. Small business is one where the total average annual turnover is less than Rs 50 crore. The turnover criterion is linked to the average of the last three years in the case of existing entities; projected turnover in the case of new entities; and both actual and projected turnover for entities which are yet to complete three years.

(ii) **Product Criterion** - The exposure (both fund-based and non-fund-based) takes the form of any of the following: revolving credits and lines of credit (including overdrafts), term loans and leases (for example installment loans and leases, student and educational loans) and small business facilities and commitments.

(iii) **Granularity Criterion** - Banks must ensure that the regulatory retail portfolio is sufficiently diversified to a degree that reduces the risks in the portfolio, warranting the 75 per cent risk weight. One way of achieving this is that no aggregate exposure to one counterpart should exceed 0.2 per cent of the overall regulatory retail portfolio. 'Aggregate exposure' means gross amount (that is, not taking any benefit for credit risk mitigation into account) of all forms of debt exposures (example: loans or commitments) that individually satisfy the three other criteria. In addition, 'one counterpart' means one or several entities that may be considered as a single beneficiary (example: in the case of a small business that is affiliated to another small business, the limit would apply to the bank's aggregated exposure on both businesses). While banks may appropriately use the group exposure concept for computing aggregate exposures, they evolve adequate systems to ensure strict adherence with this criterion. NPAs under retail loans are to be excluded from the overall regulatory retail portfolio when assessing the granularity criterion for risk-weighting purposes.

(iv) **Low value of individual exposures** - The maximum aggregated retail exposure to one counterpart should not exceed the absolute threshold limit of 5 crores.

The below claims have to be excluded from the Regulatory Retail Portfolio:

- (a) Exposures by way of investments in securities (such as bonds and equities), whether listed or not;
  - (b) Mortgage Loans to the extent that they qualify for treatment as claims secured by residential property 39 or claims secured by commercial real estate 40;
  - (c) Loans and Advances to bank's own staff which are fully covered by superannuation benefits and / or mortgage of flat/ house;
  - (d) Consumer Credit, including Personal Loans and credit card receivables;
  - (e) Capital Market Exposures;
  - (f) Venture Capital Funds.
1. Loans and advances to bank's own staff which are fully covered by superannuation benefits and/or mortgage of flat/ house will attract a 20 per cent risk weight.
  2. Other loans and advances to bank's own staff will be eligible for inclusion under regulatory retail portfolio and will therefore attract a 75 per cent risk weight.
  3. The deposits kept by banks with the CCPs, namely Clearing Corporation of India Limited (CCIL), the risk weight will be 20 per cent and the deposits kept by banks with other CCPs, risk weight will be according to the ratings assigned to these entities.

### ***Past Dues***

#### **1. Risk Weight Application for unsecured portion of NPAs:**

- a. The unsecured portion of NPA (other than a qualifying residential mortgage loan), net of specific provisions (including partial write-offs), will be risk-weighted as follows:
  - (i) 150 per cent risk weight when specific provisions are less than 20 per cent of the outstanding amount of the NPA
  - (ii) 100 per cent risk weight when specific provisions are at least 20 per cent of the outstanding amount of the NPA
  - (iii) 50 per cent risk weight when specific provisions are at least 50 per cent of the outstanding amount of the NPA
- b. In addition to the above, where a NPA is fully secured by the following forms of collateral that are not recognized for credit risk mitigation purposes, either independently or along with other eligible collateral a 100 per cent risk weight may apply, net of specific provisions, when provisions reach 15 per cent of the outstanding amount:
  - (i) Land and building which are valued by an expert valuer and where the valuation is not more than three years old
  - (ii) Plant and machinery in good working condition at a value not higher than the depreciated value as reflected in the audited balance sheet of the borrower, which is not older than eighteen months.
- c. For the purpose of computing the level of specific provisions in NPAs for deciding the risk-weighting, all funded NPA exposures of a single counterparty (without netting the value of the eligible collateral) is reckoned in the denominator.
- d. For the purpose of defining the secured portion of the NPA, eligible collateral is the same as recognized for credit risk mitigation purposes. Hence, other forms of collateral like land, buildings, plant, machinery, current assets, and so on is reckoned while computing the secured portion of NPAs for capital adequacy purposes.

#### **2. Risk Weight Application for unsecured portion of NPAs which are Claims secured by residential property:**

Claims secured by residential property which are NPA will be risk weighted as follows:

- (i) 100 per cent risk weight when specific provisions are less than 20 per cent of the outstanding amount of the NPA
- (ii) 75 per cent risk weight when specific provisions are at least 20 per cent of the outstanding amount of the NPA and less than 50 per cent of the outstanding amount of the NPA
- (iii) 50 per cent risk weight when specific provisions are at least 50 per cent of the outstanding amount of the NPA

### ***Capital and Provisioning Requirements for Exposures to Entities with Unhedged Foreign Currency Exposure***

#### **Overview**

The unhedged foreign currency exposures are affected by the volatility in exchange rate movements. These impact the capacity of the holders to fulfill their credit obligations towards the banks and hence result in default losses and thereby affects the complete financial system.

To resolve this issue, the application has been updated with the changes suggested by the RBI. The changes include provisioning and determining capital requirements due to Unhedged Foreign Currency Exposures (UFCE).

Foreign Currency Exposure (FCE) refers to the gross sum of all items on the balance sheet that have impact on profit and loss account due to the movement in foreign exchange rates. Financial hedges and Natural hedges are recognized for the purpose of calculating unhedged foreign currency exposures. Financial hedge is considered when the exposure is hedged using a derivative contract. Natural hedge occurs between 2 exposures when both of them have opposite cash flows in the same accounting year. Based on these criteria of hedging, the unhedged foreign currency exposure is computed.

The RBI guidelines refer to the unhedged foreign currency exposure of the counterparties that the reporting entity has an exposure to. For example, if bank A has an exposure to corporate B, where corporate B has foreign exposures to its customers (say C and D), then if this exposure of B is not hedged, it will be called as unhedged foreign currency exposures and will need to be reported by corporate B to Bank A. Bank A will then consider this as UFCE of B for its risk weighting purposes and compute capital and provisions accordingly.

The application assess the extent of possible loss that arise in case of volatility in the exchange rate to compute the incremental capital requirements that need to be maintained by the bank for UFCE. This possible loss is based on the annualized volatility of the USD-INR exchange rate. For the overseas branches/subsidiaries of the bank, the local currency of that jurisdiction is substituted to INR. This annualized volatility has been computed by taking the largest annual volatility as seen in the last 10 years' historical data in adverse direction. This annualized volatility is provided by FEDAI (Foreign Exchange Dealers' Association of India) on instructions from RBI in due course of time on a daily basis and posted on FEDAI's website. The resulting annualized volatility is used to calculate the loss by multiplying with UFCE amount declared by the counterparty entity.

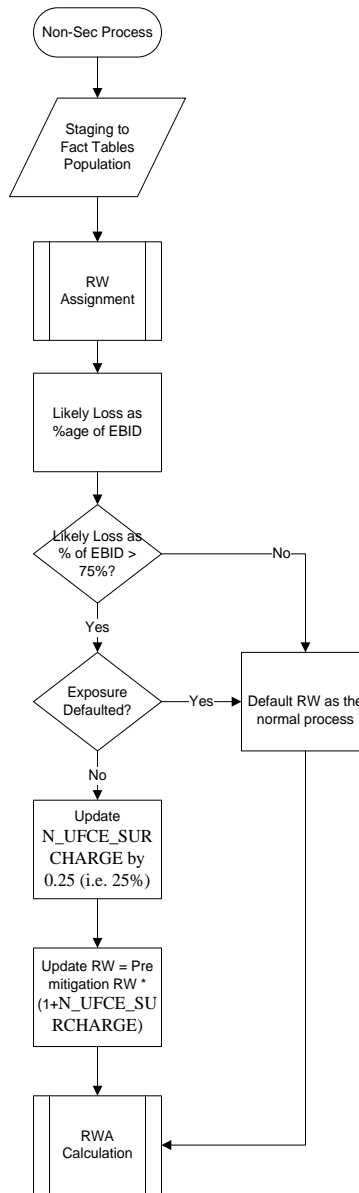
After computing the loss figure, it is compared with the Earnings before Interest and Depreciation (EBID) of the counterparty and expressed in percentage. Higher the percentage, higher the susceptibility of the entity (counterparty) to adverse exchange rate movements. Therefore, all exposures to such entities (whether in foreign currency or in INR), attract incremental capital and provisioning requirements.

UFCE is monitored on a monthly interval and the incremental capital requirements are computed at least quarterly. The frequency of this calculation may increase depending on the volatility of USD-INR exchange rate. For Incremental capital requirements, exposure amount that is used for the credit risk capital requirements is used.

For new entities or projects under implementation where the EBID value is not available, the application

calculates the incremental capital requirements based on projected average EBID for the three years from the date of commencement of commercial operations.

The flowchart for UFCE process is provided below:



## Counterparty Credit Risk (CCR)

### *Over the Counter Derivative Products*

The Basel committee has introduced Counterparty Credit Risk (CCR), wherein the counterparty can default before the final settlement of a transaction. Unlike the firm's exposure to credit risk arising from a loan, CCR creates a bilateral risk of loss. Market value of the transaction can be positive or negative for either parties in the transaction at different points in time, till the maturity or closure of the transaction. This market value is dependent on the movement of the underlying risk factor. The Basel committee has proposed Rules to calculate the EAD or exposure amount for the instrument with CCR.

**NOTE:** All OTC Derivatives and Repo products are part of the CCR computation. Also, all the trades with Central Counterparty (CCP) are assigned a zero risk weight.

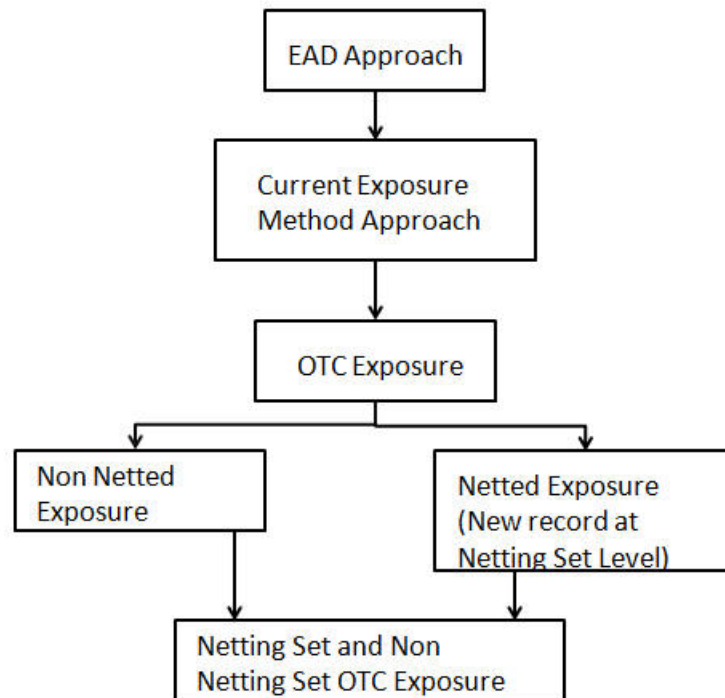
The application's treatment for the instrument with CCR is divided into three categories:

- Exposure at Default (EAD)
- Risk Weighted Asset (RWA)
- Credit Risk Mitigation (CRM)

**Process Flow for Over the Counter Derivatives – EAD Approach**

- **Exposure at Default (EAD)**

A comprehensive explanation of the process flow is as follows:



The exposure amount which is subject to CCR is estimated by the current exposure method approach as described in the RBI Basel III guidelines. The application calculates EAD with Current Exposure Method as laid out in the RBI Basel III guidelines.

- **Current Exposure Method**

The application calculates the EAD for two different sets of the records with a different methodology -Netting Agreement Records and Non Netting Agreement Records.



- OTC Exposure

For the calculation of EAD, the exposure amounts from the exposure table are moved to a different table for OTC and REPO transactions. The application also creates a record for each netting agreements in the data.

- Non Netted Exposure

To compute EAD for non netting records the application reads the following inputs:

- Total replacement cost which is greater than Mark to Market value or zero for all the contracts.
- An amount for potential future credit exposure is calculated based on the notional amount and multiplied by the add-on factor based on the underlying type in the contracts. The assignment of Add-on for different products is represented in the following table:

	Credit Conversion Factors (%)	
	Interest Rate Contracts	Exchange Rate Contracts and Gold
One year or less	0.50	2.00
Over one year to five years	1.00	10.00
Over five years	3.00	15.00

The Rule: India - Non Sec Add-on Estimation assigns the add-on percent in the processing Non Securitization table. Data is populated to Nettable Pool (**FCT\_NETTABLE\_POOL**) table by T2T: **NETTABLE\_POOL\_OTC\_POPULATION\_OTHERS**

- Netted Exposure

To compute EAD for netting agreement records, the application reads the following inputs:

- Total replacement cost which is greater than Mark to Market value for all the contracts.
- An amount for potential future credit exposure is calculated based on the notional and multiplied by the add-on factor based on the following formula:

$$A_{net} = 0.4 * A_{Gross} + 0.6 * NGR * A_{Gross}$$

The application creates records for netting agreement and then populates into the OTC Exposure table. It selects all the records with the following attributes which are similar to computing the netting agreement exposure:

- Trades with Entity
- Customer
- Product Level – All OTC trades
- Netting Agreement

- Book Code: Trading or Banking
- Long Settlement transaction Flag
- GAAP Code

The following T2Ts are used to create and populate the OTC exposure table:

- NETTABLE\_POOL\_OTC\_POPULATION
- NET\_POOL\_EXPOSURE\_CREATION

The add-on percent netting agreement is achieved by using the following calculations:

- Gross Current Exposure Calculation for OTC Derivatives
- Gross Potential Exposure Calculation for OTC Derivatives
- Net Current Exposure Calculation for OTC Derivatives
- Net Gross Ratio Calculation for OTC Derivatives
- Net Potential Exposure Calculation for OTC Derivatives

Exposure at default for all instruments with CCR risk is calculated using the following calculations:

- Exposure Calculation for OTC Derivatives

The **India - Equity OTC Derivative EAD Calculation** rule is used for equity computation.

- **Risk Weighted Asset (RWA) Approach**

RWA calculation for the instruments which are subject to CCR risk is similar to RWA calculation for other instruments.

- **Credit Risk Mitigation (CRM) Approach**

CRM calculation for the instruments which are subject to CCR risk is similar to CRM calculation for other instruments.

#### *Credit Risk Securities Financing Transactions (SFT)*

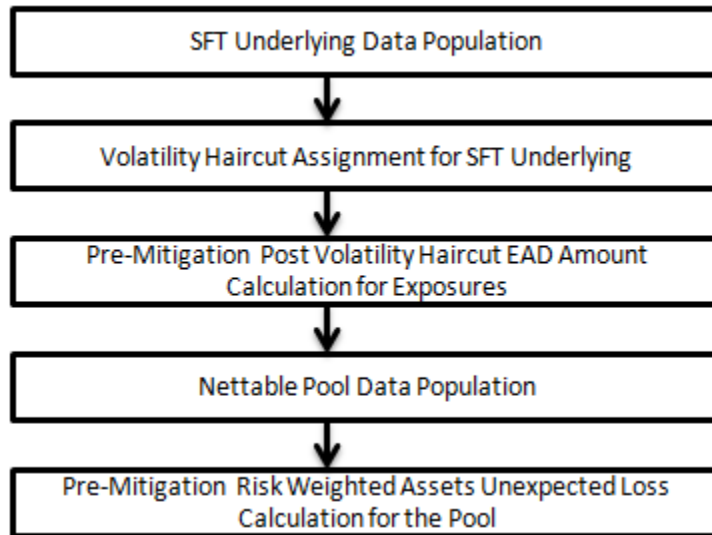
Securities Financing Transactions (SFT) includes Repo Style transactions, Margin Lending, Security Financing Borrowing, and so on. The SFT portfolio of a bank is included for capital charge calculations as per standardized, Approach for India. The application takes the notional amount as the EAD amount.

The SFT EAD calculation follows the Collateral Haircut Approach methodology.

- For all SFT contracts which have a mitigant mapped to it, the application computes CRM based on the RWA approach undertaken by the bank. For standardized approach, a risk weight is applied for all eligible mitigants based on mitigant value post haircut adjustment.

#### **Process Flow for Credit Risk Securities Financing Transactions**

SFT EAD is computed in the sub process **SFT Exposures RWA - Collateral Haircut Approach**.



- A comprehensive explanation of the process flow is as follows:

- **SFT Underlying Data Population:**

The two data elements present in SFT transactions are as follows:

Firstly, the parent transaction is captured and second the underlying information, on which the parent transaction is built, is captured separately with a data identifier (**STG\_UNDERLYING\_EXPOSURES.V\_UNDERLYING\_DATA\_IDENTIFIER**) as **REPO** for Repo transaction or **MLT** for Margin Lending Transaction. Additionally, the underlying data captures parent identifier code against each of the records (**V\_Parent\_exposure\_ID**). For multiple underlying data for a single parent, the unique parent identifier code is repeated across the underlying data.

- **Haircut Assignment for SFT Underlying:**

This is computed by the following Rules:

- Basel Product Type Level1 for SFT - Comprehensive Method
      - Non Sec Basel Methodology Assignment for SFT Comprehensive Method – STD
      - FCT\_SFT\_UNDERLYING\_DATA\_POPULATION
      - Del\_NonSec\_SFT\_Undrly
      - Forex Haircut for SFT Underlying
      - Non Sec Pre-Netting EAD Calculation for SFT

- **Pre-Mitigation Post Volatility Haircut EAD Amount Calculation for Exposures:**

For SFT transaction, the application calculates EAD for the parent exposure, based on the underlying information. The underlying exposures are processed in **FCT\_SFT\_UNDERLYING** table and then the EAD computed is moved to parent record in **FCT\_NON\_SEC\_EXPOSURES**. Each underlying exposure is assigned a volatility haircut, if the underlying exposures are financial instruments. FOREX haircut is applied if the underlying and the parent contract are in different currency. Each SFT underlying exposure adjusted for haircut (EAD + haircut value) is added as EAD to the parent contract (Pre mitigation, post volatility haircut EAD).

- **Nettable Pool Data Population:**

The application nets SFT contracts based on the same customer, common netting agreement identifier, 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 EAD computations as above are taken from FCT\_NON\_SEC\_EXPOSURES to FCT\_NETTABLE\_POOL after netting them based on the same netting agreement code.

- **Pre-Mitigation Risk Weighted Assets Calculation for the Pool:**

Pre-Mitigation Risk Weighted Assets are calculated for the pool as EAD, netted as above, multiplied by the risk weight.

- **Unsettled Transactions:**

Calculation of exposure for Delivery versus Payment (DvP) and Non DvP transactions is done by subtracting the mark-to-market value from contract amount (for DvP transactions) and assigning the mark-to-market value (for non-DvP transactions). This is done using the rule: "India - Non Sec Pre-Mitigation EAD Amount for unsettled Transaction".

**For DvP Transactions** – If the payments have not yet taken place five business days after the settlement date, banks are required to calculate a capital charge by multiplying the positive current exposure of the transaction by the appropriate factor as under:

Number of working days after the agreed settlement date	Corresponding risk multiplier (in per cent)
From 5 to 15	9
From 16 to 30	50
From 31 to 45	75
46 or more	100

**For non-DvP transactions (free deliveries)** after the first contractual payment / delivery leg, the bank that has made the payment treats its exposure as a loan if the second leg has not received by the end of the business day. If the dates when two payment legs are made are the same according to the time zones where each payment is made, it is deemed that they are settled on the same day. For example, if a bank in Tokyo transfers Yen on day X (Japan Standard Time) and receives corresponding US Dollar via CHIPS on day X (US Eastern Standard Time), the settlement is deemed to take place on the same value date. Banks compute the capital requirement using the counterparty risk weights prescribed in these guidelines. However, if five business days after the second contractual payment / delivery date the second leg has not yet effectively taken place, the bank that has made the first payment leg will receive a risk weight of 1111% on the full amount of the value transferred plus replacement cost, if any. This treatment applies until the second payment / delivery leg is effectively made.

## CRM

- **Allocation of Mitigants to Exposures:**

This process loads the mitigant mapping data from the stage table to its corresponding processing tables. Mitigants are allocated to the respective exposures that they are covering. The application defines how much of the bank's exposure the mitigant is covering. Shareholding percent is applied to the mitigant amounts. The application has a pre-built optimizer for optimum allocation of mitigants to the exposures for credit risk mitigation purposes. One-to-One, Many-to-One, and Many-to-Many mapping of mitigants are handled in an efficient manner, involving storage of intermediate computations for traceability.

All mitigants which are eligible and mapped to an exposure are then populated to a table where each exposure is broken down by mitigant type.

The application uses linear programming logic to allocate the mitigants to the exposures. Pooling identifies the exposure and mitigant data from sub exposures table. Exposure identifier and mitigant identifier are the attributes on which pooling is performed. It assigns the pool id for each exposure-mitigant combination. Based on these pool ids, optimizer task allocates covered factor to exposures. Optimizer does the optimum allocation of mitigants to exposures.

#### CRM Treatment to Collateral – Collateral Haircut Approach

Collateral Haircut approach is applicable when the financial collateral is for an eligible margin loan, repo-style transaction, collateralized derivative contract, or single-product netting agreement of such transactions and of any collateral that secures certain repo-style transaction that is included in VaR-based measure. Bank can use either Standard Supervisory haircut or own estimate.

All the conditions and the values related to Collateral Haircut approach (Comprehensive approach) is the same as in India approach, that is:

- Calculation of exposure amount as  $\max \{0, [(\Sigma E - \Sigma C) + \Sigma(Es \times Hs) + \Sigma(Efx \times Hfx)]\}$
- Apply Standard Supervisory volatility haircuts based on Residual Maturity, (Sovereign / Non Sovereign Issuers Risk Weight)
  - Currency Mismatch Haircut
  - Adjustments to Supervisory Haircut

The following is the method for assigning volatility haircut. Supervisory Haircut

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 RBI RBI Basel III guidelines. For Own Estimate method, the application considers the Basel transaction type of the exposure. Basel transaction types are stored in the Basel transaction type dimension (**DIM\_BASEL\_TRANSACTION\_TYPE**) table. The various transaction types available are capital market driven, repo style, and secured lending. The volatility haircut is assigned as per the Basel accord. The FOREX haircut is also assigned based on these transaction types as per Basel accord.

Only eligible mitigants are considered for haircut assignment. Haircuts mentioned in the Basel Accord assume a holding period for 10 days. However, if the holding period for mitigants is more than 10 days, then the application scales up the haircut value to reflect the correct value as per the holding period.

#### Maturity Mismatch

If there is a Maturity Mismatch between mitigant and exposure, then such mitigant is eligible only if its original maturity is greater than or equal to one year and its residual maturity is greater than three months. A maturity mismatch occurs when the residual maturity of a credit derivative or guarantee is less than that of the hedged exposure(s).

Hence, Mitigant Eligibility = 'Y' for the case of maturity mismatch only if, original maturity is more than or equal to a year and residual maturity is greater than 3 Months.

A rule "**Exposure Mitigant Maturity Mismatch identification**" is used to identify if maturity mismatch has occurred between credit derivative or guarantee and the mapped exposure.

A **Maturity Mismatch flag** is used to hold the maturity mismatch indication.

Subsequently, the existing rule “**Mitigants Eligibility Based on Maturity Mismatch**” is used for eligibility purpose. However, it is executed based upon maturity mismatch.

Hence, Maturity mismatch = ‘Y’ if, the residual maturity of mitigant is less than or equal to 3 months.

#### Key Data Elements

Key data elements are listed in this section. For a complete list of tables and columns to be updated refer to the Download Specifications document.

#### *For Mitigants*

- Re-securitized exposures Mitigant – The mitigants belonging to re-securitized exposures will have “Y” value in this field. The application will mark them as ineligible mitigants.
- Securitized exposures Mitigant – The mitigants belonging to securitized exposures will have “Y” value in this field. The application will assign different volatility haircuts for these, depending on the current ratings and the residual maturity.

#### *For Ratings*

- Current Rating for the Guarantees and Credit derivatives issued to Non-Securitized Exposures.
- Current Rating and Original Rating for the guarantees and credit derivatives issued to Securitized Exposures.

#### ***Post CRM***

Pre - mitigation EAD is split into post mitigation EAD for covered portion (mitigant's EAD - portion of exposure that is covered by mitigant) and uncovered portion (portion of the exposure that is not covered by mitigant). For multiple mitigants covering one exposure, there is more than one record for covered portion of that exposure. Thus, each exposure is divided into sub-exposures. Post mitigation RWA Unexpected Loss (post CRM RWA UL) is calculated as the product of sub exposure amount and applicable Risk Weight. For covered portion, RW applicable will be as per mitigant assigned, for example, RW applicable to eligible guarantor. For uncovered portion, RW of exposures will continue to be applied. Sub-exposure amount are, then, aggregated to exposure level.

## **Credit Valuation Adjustment**

Basel committee has introduced a Credit Valuation Adjustment (CVA) capital charge, which is added to 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 were 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 OTC derivatives of the bank using standardized approach using RBI guidelines.

1. CVA weight Assignment: As per the existing RBI Basel III guidelines all the unrated exposure was assigned 10% weight whereas per RBI guidelines the unrated counterparties are assigned a weight of 3%. Except when counterparty is scheduled bank, the weights are assigned based on the rating in accordance to the rating below.

Ratings	Wi
AAA	0.7%
AA	0.7%
A	0.8%
BBB	1.0%
BB	2.0%
B and unrated	3.0%
CCC	10.0%

Wi is the weight applicable to counterparty 'i'. Weight is assigned to a counterparty based on its external rating.

Rule is created to assign weight to unrated schedule bank with the above table.

Wi for unrated scheduled commercial banks will be derived based on CET1+CCB ratio of the bank.

CET1+CCB of Bank	Ratings	Wi
Applicable Min CET1+CCB > 100%	AAA/AA	0.70%
Applicable Min CET1+CCB between 75% and 100%	A	0.80%
Applicable Min CET1+CCB between 50% and 75%	BBB	1%
Applicable Min CET1+CCB between 0% and 50%	BB	2%
CET1 less than applicable minimum	CCC	10%

2. RBI allows banks to adjust the Outstanding EAD which is used to calculate the CVA Charge. Reduction of Outstanding EAD after mitigation is allowed to extent of Incurred CVA Loss by the bank. Example is shown in the below table.
3. DVA amount is expected at GL level or at transaction level. Application expects you to provide data either at transactions level or GL level. If you provide data at GL level, then you need to mandatorily select deduction from capital as the option from Run management. Option to deduct or adjust with outstanding EAD is available, only when you provide data at transaction level. Following are the instances:
  - a. For deduction from capital when you provide data at GL level.
  - b. For deduction from capital when the data is provided at transaction level. The Rule needs to sum the total DVA amount from all the transactions and update against the capital head created.
  - c. For deduction from capital if you provide data at GL Level and transaction level, application will by default use the GL level data, Since GL data is audited data.

- d. For adjustment to outstanding EAD amount, the following table provides the details regarding the adjustment for the outstanding exposure (Uncovered EAD).
- e. Adjustment to each uncovered EAD needs to be done before adjusting the uncovered EAD with Maturity and discount factor adjustment done for exposure related to CVA.

Example of EAD, Incurred CVA and DVA Adjustment:

Uncovered EAD	Incurred CVA	DVA	DVA at GL Level - EAD after Incurred CVA	DVA at transaction level - EAD after Incurred CVA and DVA
100	30	10	70	80

### Assumptions

CVA hedge should be identified by the clients separately. Only single name CDS and Index Hedge are eligible for CVA. The Basel Regulatory Capital application handles the index position in the following manner:

- Both index position marked to the level of counterparty or not marked to the level of counterparty is handled by the application.
- Effective index hedge amount is considered in the CVA charge calculation at 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 Standardized Approach.

### Data Expectation

- Incurred CVA loss is captured in the column for the product processor. Column Name: n\_incurred\_cva\_amount.
- DVA Amount is captured in column for all product processor.

### Simple CVA Approach

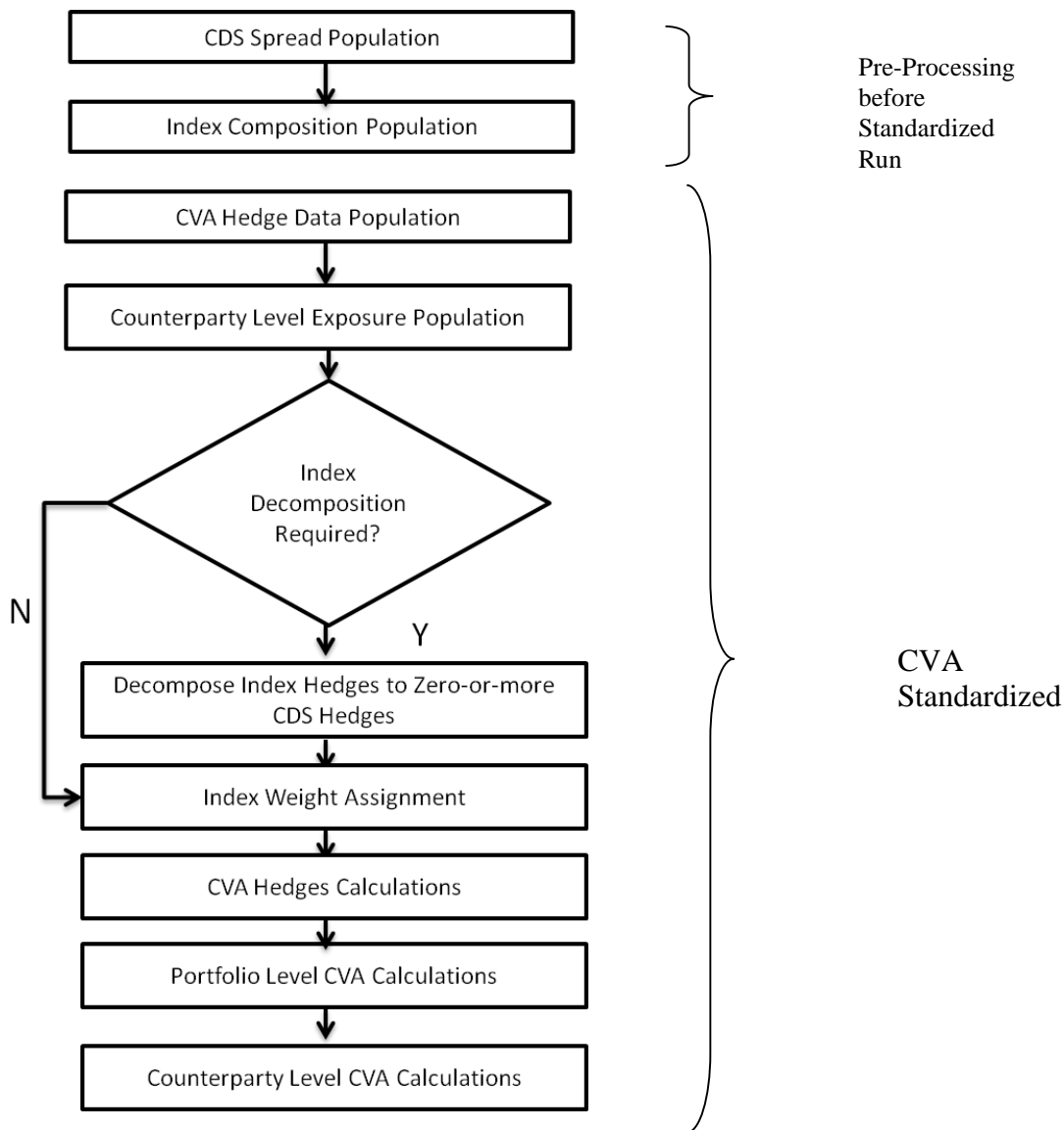
The application calculates CVA capital charge at portfolio level using the following formula as specified by RBI Basel III guidelines:

$$K_{CVA} = 2.33 \times \sqrt{\left( \sum_i 0.5 \times w_i \times (M_i \times EAD_i^{total} - M_i^{hedge} \times B_i) - \sum_{ind} w_{ind} \times M_{ind} \times B_{ind} \right)^2 + A}$$

Where:

$$A = \sum_i 0.75 \times w_i^2 \times (M_i \times EAD_i^{total} - M_i^{hedge} \times B_i)^2$$





- **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 - INDIA Credit Value Adjustment** is responsible for populating pre-processed data for CVA.

- **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. 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:

**Fact Mitigants (F\_CVA\_HEDGE):** Identifier for CVA hedge records by which the application identifies it as CVA hedge.

**Stage Mitigants (V\_REF\_ENTITY\_PARTY\_ID):** This field captures the counterparty of the hedge transaction.

**N\_CDS\_INDEX\_AVG\_SPREAD:** Average traded CDS Index Spread which is required for assignment of weight to the index.

- **Counterparty Level Exposure Population**

The application expects the uncovered EAD at netting agreement level or at trade level. This is available as an output of Current Exposure Method (CEM). If more than one netting agreement is available, then the exposures are summed at counterparty level. These aggregated data is stored in **FCT\_REG\_COUNTERPARTY\_CVA** table using **COUNTERPARTY\_EXPOSURE\_POPULATION** T2T.

Maturity adjustment discount factor is computed at netting agreement level or for each netting agreement using the formula  $1 - \exp(-0.05 * M_i) / (0.05 * M_i)$ .

Maturity is the notional weighted maturity at netting agreement level. The application sums the data for exposure at 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 PD as specified in the following table. Data is aggregated at counterparty level and stored in separate counterparty table.

Ratings	Wi
AAA	0.7%
AA	0.7%
A	0.8%
BBB	1.0%
BB	2.0%
B and unrated	3.0%
CCC	10.0%

Wi is the weight applicable to counterparty 'i'. Weight is assigned to a counterparty based on its external rating.

Rule is created to assign weight to unrated schedule bank with the above table.

Wi for unrated scheduled commercial banks will be derived based on CET1+CCB ratio of the bank.

CET1+CCB of Bank	Ratings	Wi
Applicable Min CET1+CCB > 100%	AAA/AA	0.70%
Applicable Min CET1+CCB between 75% and 100%	A	0.80%
Applicable Min CET1+CCB between 50% and 75%	BBB	1%
Applicable Min CET1+CCB between 0% and 50%	BB	2%

CET1 less than applicable minimum	CCC	10%
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- **Index Decomposition Required**

You can select index decomposition from the Run Management screen. 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 the single name CDS hedge is created, so as to get maximum benefit from hedging. Maturity of the single name CDS hedge is considered same as the maturity of index.

- **Index Weight Assignment**

For index weight assignment, index composition and counterparty probability of default is expected as a download in the application. Weight for the index is the sum of all counterparty weights multiplied by the weight of the counterparty in the index.

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**NOTE:** The risk weight cannot be different for counterparty irrespective of the number of different transaction with the counterparty.

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- **CVA Hedge Calculations**

After population of hedge data and creation of single name CDS hedge from index, the application sums the notional to counterparty level and populates in the CVA specific table. Maturity adjustment discount factor is computed by using the formula **(1-exp (-0.05\* Mihedge))/(0.05\* Mihedge)**. If more than one CDS Contract is available for the counterparty, then the above amount is summed at counterparty level. Index hedge notional amount is computed after subtracting the notional of all single name CDS hedge created by the decomposition process from index notional. 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 the index hedge amount is summed up. All the above data required for CVA calculation is populated from mitigants data to CVA specific table. The data is summed for each counterparty and stored.

- **Portfolio Level CVA Calculation**

Portfolio Level CVA Charge is calculated as per the following formula:

$$K = 2.33 \cdot \sqrt{h} \cdot \sqrt{\left( \sum_i 0.5 \cdot w_i \cdot (M_i \cdot EAD_i^{total} - M_i^{hedge} \cdot B_i) - \sum_{ind} w_{ind} \cdot M_{ind} \cdot B_{ind} \right)^2 + \sum_i 0.75 \cdot w_i^2 \cdot (M_i \cdot EAD_i^{total} - M_i^{hedge} \cdot B_i)^2}$$

The CVA charge calculated at portfolio level is populated in the **FACT\_REG\_CVA\_SUMMARY** table. Single Name CDS Hedge component for CVA at portfolio level is calculated and the summary table is populated using **CVA\_SUMMARY\_POPULATION T2T**.

- **Counterparty Level CVA Calculation**

CVA Capital Charge at counterparty level is allocated using the following formula:

CVA at Counterparty = Total CVA at Portfolio \*  $W_{CVAi}$

$$W_{CVAi} = \text{Absolute} [0.5 \cdot W_i \cdot (M_i \cdot EAD_{itotal} - M_i^{hedge} \cdot B_i) - \sum_{indi} (W_{ind} \cdot M_{ind} \cdot B_{ind})] /$$

$$\sum_i \text{Absolute} [0.5 \cdot W_i \cdot (M_i \cdot EAD_{itotal} - M_i^{hedge} \cdot B_i) - \sum_{indi} (W_{ind} \cdot M_{ind} \cdot B_{ind})]$$

## **Securitization**

Securitized exposures are exposures which are issued out of a pool of underlying exposures for the transfer of risk. Re-securitized exposures are the exposures which are issued out of a pool of underlying exposures which constitutes non-securitized exposures as well as some portion of securitized exposures. The application is capable of handling both securitized exposures as well as re-securitized exposures. It also handles the calculation for the originator as well as the investor bank roles. At a broad level, there are two categories of Investors:

- An Investing Bank who has invested heavily in securitization:

These investors are prepared to provide the entire details of the securitization transaction

To cater to these investor needs, the entire pool, entire or invested tranche details, and the invested exposures information are required to be provided by the bank. This information is captured in the pool, tranche, and exposures table.

- An Investing Bank who has invested minimal in securitization:

These investors are prepared to provide the necessary inputs required for the calculation of the capital charge pertaining to their invested exposure.

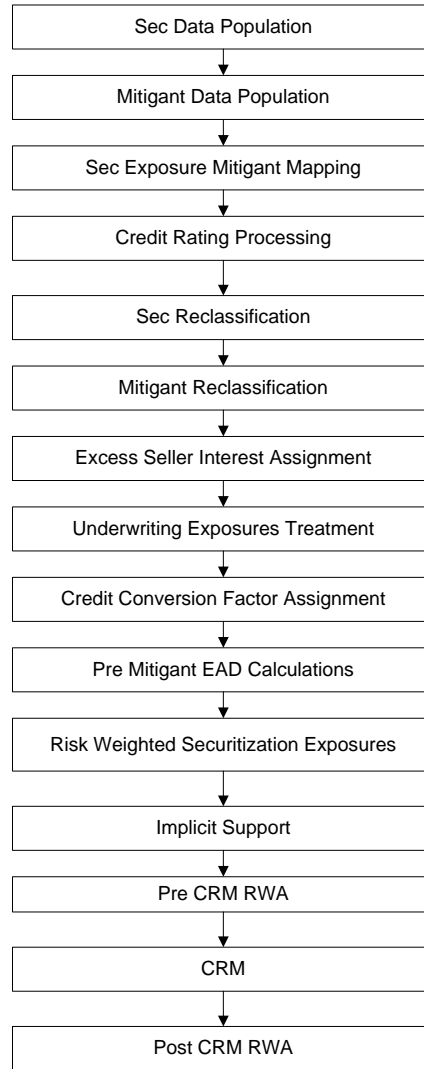
To cater to these investor needs, the invested exposures information is required to be provided as an input by the bank. A few pool and tranche attributes required for the computation are also to be provided as an input by the bank in the Stage Securitization Exposures Table (**STG\_SEC\_EXPOSURES**).

The RBI Basel III guidelines specify Standardized approach for the calculation of the capital charge for the Securitization exposures.

In some computations, the calculations pertaining to the underlying exposures of the securitization transaction are required. This is computed before processing the Securitization exposures.

### **Process Flow**

The process flow for standardized approach of Securitization exposures are as follows:



The only change in the computation of the Securitization - Standardized Approach process, in the RBI Basel III processing of the current release of the application is in the Sec Pre-CRM Computation Process. Under this process, for Sec Deduction Process, the exposures which are lower than the investment grade and the unrated exposures are risk weighted at 1111%.

- **Sec data Population, Mitigant Data Population and Sec Exposure Mitigant mapping:**

The data pertaining to the pool, tranche, exposures are populated from the staging tables to the processing tables. The underlying exposures data are captured in the respective product processor tables (and for these information, the process pertaining to the non-securitization exposures is followed). In the case of Reporting Bank providing only the exposure level information, the application expects few pool level and tranche level parameters which are required for further processing, to be provided in the Exposures table. The mitigants data are populated from the staging table to the processing table. The exposures which are mapped to the mitigants are captured and this is also populated from the staging table to the processing table. Securitization Data Population has been handled in the Process **SEC\_DATA\_POPULATION**. Mitigant data population has been handled in the Process **IND\_BASELIII\_MITIGANT\_DATA\_POPULATION** and Exposure Mitigant Mapping Population has been handled in the Process **SEC\_EXP\_MITIGANT\_MAPPING\_POP**.

- **Credit Rating Processing:**

All the 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 tables and the mitigants rating information are captured in the instrument rating details. This is handled in the IND\_BASELIII\_CREDIT\_RATING\_PROCESSING process.

- **SEC\_RECLASSIFICATION and MITIGANT RECLASSIFICATION:** The application uses the standardized data for all kinds of calculation (Product type like Eligible Liquidity Facility, Bank Role like Originator, Pool Type like Receivables-corporate pool). Before any calculation the application reclassifies the Bank specific data to standard data, similar to the Basel accord terms. It reclassifies the Bank role to the standard Bank Role of an Originator or Investor. Any other bank roles like Sponsor, Credit Protection Provider and so on, will be reclassified into Originator, Investor and so on respectively. The application also reclassifies the Pool Type to the standard Pool Type like Credit Cards Receivable Pool, Auto Loans and so on. It also reclassifies the Product type to the Standard Product type like Eligible Liquidity Facility and so on.

In the case of mitigants also, the application reclassifies the mitigant type to the standard Mitigant type like the debt securities, credit derivative, cash and so on. It also reclassifies the Mitigant Issuer type to the standard Mitigant Issuer type like Banks, Corporate and so on. The reclassification tasks are present in Sec reclassification and Mitigant reclassification sub process. The application assigns 'Sec - Standardized Approach' in the **Sec Reclassification** Sub Process. This is done for approach selection.

- **Excess Sellers Interest Assignment**

Transfer of significant credit risk associated with the securitized exposures to the third parties is required for recognition of risk transfer for a securitization originator. The total exposure of banks to the loans securitized in the following forms does not exceed 20% of the total securitized instruments issued:

- Investments in equity / subordinate / senior tranches of securities issued by the SPV including through underwriting commitments.
- Credit enhancements including cash and other forms of collaterals including over-collateralization, but excluding the credit enhancing interest only strip.
- Liquidity support.

If a bank exceeds the above limit, the excess amount would be risk weighted at 1111%.

All retained exposures, credit enhancements and liquidity facilities identified based on the product type are aggregated for each pool. The aggregate is compared with the Initial Pool Exposure Amount (n\_initial\_pool\_exposure\_amount) available at Pool level. If the aggregate amount of exposures exceeds 20% of pool amount then all these exposures are split into two legs. First leg will capture the below 20% threshold limit amount and will be risk weighted as per the rating of the exposure. Second leg will capture the above 20% threshold limit amount and will be risk weighted at 1111%. The second leg will be identified via attribute 'Excess Seller Interest Flag' being set as 'Y'.

- **Underwriting Exposure Treatment**

The holding of securities devolved on the originator through underwriting is sold to third parties within three-month period following the acquisition. In case of failure to off-load within the stipulated time limit, any holding in excess of 20% of the original amount of issue, including secondary market purchases, receives a risk weight of 1111%.

Investments in securities devolved on the originator through underwriting are identified based on attribute 'Underwriting Investments Flag' captured at Securitization Exposures level.

The aggregate amount of all exposures where Underwriting Investments Flag is 'Y' and where the holding is less than 3 months is compared with the Initial Pool Exposure Amount (n\_initial\_pool\_exposure\_amount) available at Pool level. If the aggregate amount of exposures

exceeds 20% of pool amount then all these exposures are split into two legs. First leg will capture the below 20% threshold limit amount and will be risk weighted as per the rating of the exposure. Second leg will capture the above 20% threshold limit amount and will be risk weighted at 1111%. The second leg will be identified via attribute 'Underwriting Exposure Above Threshold Limit Flag' being set as 'Y'.

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***NOTE:** The below 20% threshold limit leg of exposures in underwriting investments is risk weighted based on the external rating of the security and not applied a risk weight of 100% as directed in previous RBI circular on securitisation to support RCA3 reporting requirements. Currently RCA3 reporting template only allow risk weighting of all exposures only based on external ratings.*

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- **Credit Conversion factor (CCF) Assignment**

Banks calculate the risk weighted amount of a rated off-balance sheet securitization exposure by multiplying the credit equivalent amount of the exposure by the applicable risk weight. The credit equivalent amount is arrived at, by multiplying the principal amount of the exposure (after deduction of specific provisions) with a 100% CCF for all such transactions except the undrawn portion of an unrated eligible liquidity facility which attracts a CCF of 50%.

If the off-balance sheet exposure is unrated then it is deducted from capital, except an unrated eligible liquidity facility.

The drawn and undrawn portions of an unrated eligible liquidity facility attracts a risk weight equal to the highest risk weight assigned to any of the underlying individual exposures covered by this facility.

All unrated ineligible liquidity facilities, both the drawn and undrawn portions receive a risk weight of 1111%. The undrawn portion of an unrated ineligible liquidity facility attracts a credit conversion factor of 100%.

- **Pre Mitigant EAD calculation**

All off-balance sheet exposures, except an unrated eligible liquidity facility which attracts a CCF of 100%. An unrated eligible liquidity facility attracts a CCF of 50%.

The EAD logic first nets off any available specific provisions with the drawn amount and any excess provision amount are netted off against the undrawn limit amount. The final undrawn amount net of specific provisions is multiplied by the CCF to determine the EAD. This EAD is subsequently multiplied with the associated RW of exposure to arrive at the RWA amount.

A rule '**IND Basel III Sec Pre-Mitigation EAD Amount - STD**' used to compute EAD for securitization exposures is added. A BP is added as a target BP, and is mapped in this rule. The BP first nets off any available specific provisions with the drawn amount and any excess provision amount are netted off against the undrawn commitment amount. The final undrawn amount net of specific provisions is multiplied by the CCF to determine the EAD.

- **Application of External Ratings**

A bank applies external credit assessments from eligible external credit rating agencies consistently across a given type of securitization exposure. Furthermore, a bank cannot use the credit assessments issued by one external credit rating agency for one or more tranches and those of another external credit rating agency for other positions (whether retained or purchased) within the same securitization structure that may or may not be rated by the first external credit rating agency. Where, two or more eligible external credit rating agencies are used. These assess the credit risk of the same securitization exposure differently. The following is applicable:

1. If there is only one rating by a chosen credit rating agency for a particular claim, that rating is used to determine the risk weight of the claim.

2. If there are two ratings accorded by chosen credit rating agencies that map into different risk weights, the higher risk weight is applied.
3. If there are three or more ratings accorded by chosen credit rating agencies with different risk weights, the ratings corresponding to the two lowest risk weights is referred to and the higher of those two risk weights is applied. That is, the second lowest risk weight.

For banks that invest in securitization transactions, that is, securities issued under a Securitization program and also provide credit protections to the same securitization program, all investment securities need to be considered as unrated for the purpose of risk weighting. For example, if a bank buys an ABS / MBS where it provides an unfunded securitization exposure extended to the securitization programmed (for example, liquidity facility or credit enhancement), and that exposure plays a role in determining the credit assessment on the securitized assets/various tranches of the ABS/MBS, the bank treat the securitized assets/various tranches of the ABS/MBS as if these were not rated.

- **Risk Weighted Securitization Exposures**

Banks calculate the risk weighted amount of an on-balance sheet securitization exposure by multiplying the principal amount (after deduction of specific provisions) of the exposures by the applicable risk weight. The risk-weighted asset amount of a securitization exposure is computed by multiplying the amount of the exposure by the appropriate risk weight determined in accordance with issue specific rating assigned to those exposures by the chosen external credit rating agencies as indicated in the following table:

**Securitisations Exposures – Risk Weight Mapping to Long-Term Ratings**

Domestic rating agencies	AAA	AA	A	BBB	BB	B and below or unrated
Risk weight for banks other than originators (%)	20	30	50	100	350	1111
Risk weight for originator (%)	20	30	50	100	1111	

The risk-weighted asset amount of a securitization exposure in respect of MBS backed by commercial real estate exposure is computed by multiplying the amount of the exposure by the appropriate risk weight determined in accordance with issue specific rating assigned to those exposures by the chosen external credit rating agencies as indicated in the following table:

**Commercial Real Estate Securitisation Exposures – Risk Weight mapping to long-term ratings**

Domestic Rating Agencies	AAA	AA	A	BBB	BB	B and below or unrated
Risk weight for banks other than originators (%)	100	100	100	150	400	1111
Risk weight for originator (%)	100	100	100	150	1111	

Credit enhancements which are first loss positions are risk weighted at 1111%.

If an originating bank fails to meet the requirement laid down for Originating banks under the RBI Revised Securitization guidelines, it needs to maintain capital for the securitized assets/ assets sold as if these were not securitized/ sold. This capital is in addition to the capital which the bank is required to



maintain on its other existing exposures to the securitization transaction. For exposures part of the pool where the attribute '**Originator Prudential Requirement Met Flag**' is 'N' are considered as exposures where the Originator does not satisfy the regulatory conditions as defined by RBI such as minimum retention requirement (MRR), minimum holding period (MHP), upfront profit booking etc and are risk weighted at 1111%.

The investing banks assigns a risk weight of 1111% to the exposures relating to securitization/ or assignment where the requirements for investing banks under the RBI Revised Securitization guidelines are not met. For exposures where the attribute '**Risk profile due diligence met indicator**' is 'N' are considered as investments where the bank not satisfy the regulatory conditions as defined by RBI such as Due diligence requirements, disclosure requirements etc and are risk weighted at 1111%.

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NOTE: The amortization of cash profit arising out of securitization transaction required to be done at the end of every financial year is expected to be handled as part of source systems and the exposure level amount received from source to OFSAA must be post such amortization.

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### Re-Securitization Exposures

Banks in India including their overseas branches are not permitted to assume exposures relating to Re-securitization, as defined in RBI Revised Securitization Guidelines. However, some of the Indian banks have invested in CDOs and other similar securitization exposures through their overseas branches before issuance of revised circular. Some of these exposures may be in the nature of re-securitization. For such exposures, the risk weights are assigned as shown in the following table:

**Re-securitisation Exposures – Risk Weight Mapping to Long-Term Ratings**

Domestic rating agencies	AAA	AA	A	BBB	BB	B and below or unrated
Risk weight for banks other than originators (%)	40	60	100	200	650	1111
Risk weight for originator (%)	40	60	100	200		1111

**Commercial Real Estate Re-Securitisation Exposures – Risk Weight Mapping to Long-Term Ratings**

Domestic rating agencies	AAA	AA	A	BBB	BB and below or unrated
Risk weight for banks other than originators (%)	200	200	200	400	1111
Risk weight for originator (%)	200	200	200	400	1111

- **Implicit Support**

The Originator is not permitted to provide any implicit support to investors in a securitization transaction. When a bank is deemed to have provided implicit support to a securitization, it must hold capital against all of the exposures associated with the securitization transaction as if they had not been securitized.

Where a securitization transaction contains a clean-up call and the clean up call can be exercised by the originator in circumstances where exercise of the clean up call effectively provides credit enhancement, the clean up call shall be treated as implicit support and the concerned securitization transaction will attract the above prescriptions.

An instance where the Originator is deemed to have provided implicit support is identified where the existing attribute Implicit Support Indicator (f\_implicit\_support\_ind) is sourced as Y at the Securitisation Pool level. A process '**Implicit Support Treatment**' is added to handle the implicit

support treatment. This process consists of a rule '**IND Basel III Implicit Support Underlying Exposures Capital Assignment**' which is used to set the existing flag Securitised Flag (f\_secured\_flag) in Fact Non Sec Exposures as N for all the underlying exposures as part of the pool where implicit support is available. Once the underlying exposures are marked as non-secured they start getting reported and included as part of capital computation process.

Where a securitisation transaction contains a clean-up call, and the clean up call is exercised by the originator in circumstances where exercise of the clean up call effectively provides credit enhancement, the implicit flag (if not already Y) is updated as Y and then the above treatment to include the underlying exposures under capital computation will follow. For this purpose a rule '**IND Basel III Implicit Support Flag Assignment for Clean Up Calls**' is added to update the Implicit Support flag as Y whenever a clean up call is not eligible. The attribute CleanUp Call Option Indicator (f\_cleanup\_call\_option\_ind) is used to identify the scenarios where an eligible clean up call is available.

- **Sec STD Pre CRM Computations:** The application calculates the Pre-CRM RWA for the exposures by multiplying the Pre-CRM EAD with the Risk Weight of the exposures. This is handled in the Sec STD Pre CRM Computations sub process. The exposures which are below investment grade and the unrated exposures are deducted from the capital. This is handled in the Sec Deduction sub process.
  - Risk Weight Assignment: The application assigns the risk weight to the exposures based on the external rating assigned to the exposures. If the exposures have internal ratings assigned, the application treats the exposures as unrated. Initially the risk weight assigned to each of the ratings is assigned and then the multiple assessments is applied by the application. In the case of multiple ratings assigned to the exposures, the application applies the multiple assessments and assigns the ratings which are the worst of the best two ratings.
 

Then, the application updates the rating after multiple assessments and the corresponding risk weight to the exposures. In the case of securitization and resecuritization exposures, the risk weights assignment are different from the non-securitization exposures. The application assigns the risk weights based on the Bank role, whether the exposure is an exposure issued out of a Securitization or Resecuritization pool and then the external ratings assigned to the exposures. In case of unrated exposures, the application applies the look through approach and assigns the weighted average risk weight of the underlying exposures.

The application also handles other securitization exposures like the Eligible Liquidity Facility, Credit Enhancements which are first loss positions and so on. Risk weights corresponding to the external ratings are assigned in the entity Securitization Risk Weight Map Master (FSI\_SEC\_RW\_MAP\_MASTER) and the final applicable risk weight is updated in Securitization Exposures after the multiple assessments of the ratings.
  - Pre-CRM EAD Computation: The application assigns the credit conversion factor (CCF) to the off-balance sheet items as specified by the RBI Basel III guidelines. The CCF percentages are assigned based on the Bank Role (this is applicable only for the Originator Bank Role), the Product Type (like the Eligible Liquidity Facility) and the applicable ratings. Then, the application computes the Pre-Mitigation EAD. This is computed based on the Bank role and the Product type. The application calculates the EAD for the Investors and the Originators separately based on the calculations given in the RBI Basel III guidelines.
- **Sec CRM Process:** Mitigant Eligibility, Mitigant Risk Weight, Haircut Assignment and Allocation of Mitigants to Exposures are handled in either of Mitigant Eligibility and Volatility Haircut assignment sub process or within the Sec CRM sub-process.
  - Mitigant Eligibility: The application identifies the eligible mitigants based on the criteria as mentioned by the RBI Basel III guidelines. It identifies the following mitigants in the case of secured exposures – Collateral, Guarantees and Credit Derivatives. The application is capable of using the Simple Approach as well as the Comprehensive Approach for the mitigants which are part of the collateral. This is similar to the mitigant eligibility of the non-securitization process.

The application processes the multiple assessments of ratings for the mitigants also. This is required since some of the mitigant eligibility criteria are based on the ratings and risk weight of the mitigants. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant type, the credit rating assigned to the mitigant or the party (as applicable). All equity based mitigants are classified as ineligible as per the RBI Basel III guidelines. In the case of Mutual funds, the eligibility is based on the eligible mutual fund indicator.

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.

Unfunded deduction are considered eligible only when they are currently rated BBB- or better and were externally rated A- or better at the time the credit protection was provided. For such protections, both the current and initial ratings are expected to be provided from source.

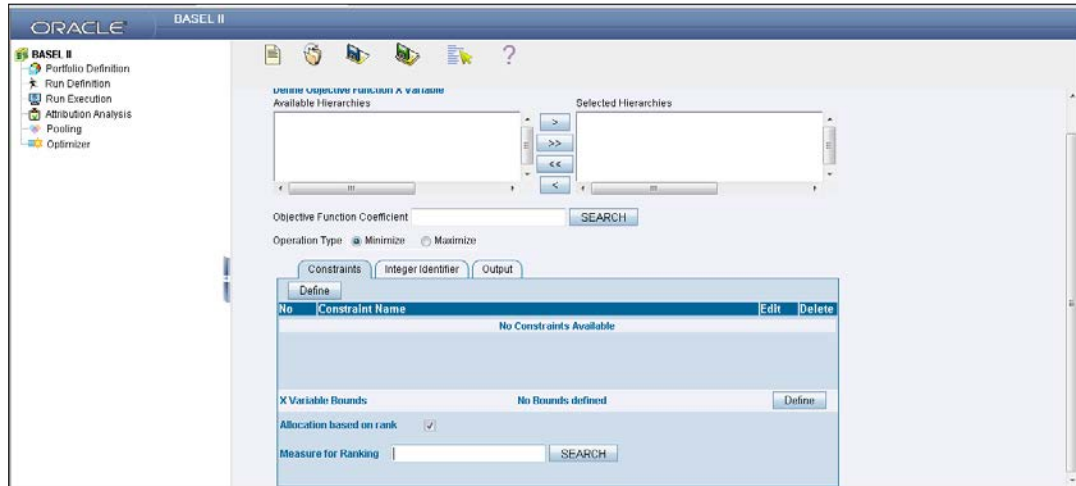
Based on the criteria of eligibility mentioned in the RBI Basel III guidelines, the application identifies whether the mitigant is eligible or not, and if eligible, the application also makes the least risk weighted exposure as the eligible mapping, for the least eligible nth to default mitigant for the exposure. It also identifies the eligibility of the mitigants based on the comparison of the risk weight of the exposures and the mitigants. If the mitigants risk weight is lesser than that of the exposures, then the mitigants become eligible. Else the application makes them ineligible.

**Mitigant Risk Weight:** The application calculates the mitigant risk weight similar to the exposure risk weight of non-securitized exposures. This is based on the Issuer type and the credit rating which includes the unrated issuers as well. The application performs the multiple assessments for the mitigants, similar to the process followed in the case of non-securitized exposures, and arrives at a single rating for the mitigant. Then, the application assigns the final risk weight to the mitigant.

- **Haircut Assignment:** The application assigns the various haircuts, as applicable to the Mitigants. The application applies the volatility haircut, forex haircut and the maturity mismatch haircut to the mitigants as appropriate. This is as per the RBI Basel III guidelines regulations. Only eligible mitigants are considered for haircut assignment and for further processing. The eligible mitigants flows from mitigants table to sub exposures table.
- **Allocation of Mitigants to Exposures:** The application computes the mitigant value post all haircuts. Then, it uses the pooling and optimizer logic to allocate the exposures to the mitigants. This is slightly different from the optimizer logic of non-securitization exposures as the securitized exposures have the seniority in the cashflow and always the senior most exposure gets the maximum protection by the mitigants. The senior most exposure (or tranche) is denoted with seniority 1 and the second senior exposure is denoted with seniority 2 and so on. In the case of securitization exposures, always the mitigants is given preference to the senior most exposure and then to the other exposures based on the seniority. The other parameters which are considered in the allocation logic are the risk weight and the mitigant value post haircut.

The application uses the linear programming logic to allocate the mitigants to the exposures. The pooling logic in securitization is same as of that non-securitization. The optimizer logic for Securitization is slightly different and the difference is explained below:

Based on the seniority of the exposures, risk weight of the exposures and the mitigant and the mitigant value, the rank order in which the mitigants are allocated to the exposures is arrived at. The order of allocation can be changed by editing the database function. You can choose the allocation rank measure in the optimizer definition screen while defining the optimizer logic.



The remaining steps for creating optimizer definitions are same as those mentioned in non-securitization process. The optimizer works on the minimization constraint logic.

*Single Mitigant mapped to Single or Multiple Exposures*

If there are one or more than one exposures mapped to a single mitigant, the mitigant is allocated to the exposure with the highest seniority

If there are more than one exposures with the same highest seniority, then the mitigant is allocated to the exposure which yields the highest mitigant value post haircut

*Single Exposure mapped to Single or Multiple Mitigants*

If there are one or more than one mitigants mapped to a single exposure, the least risk weighted mitigant will be allocated to the exposure

If there are more than one mitigants with the same least risk weight, then the mitigant which has the highest mitigant value post haircut will be allocated to the exposure

*Multiple Exposures mapped to Multiple Mitigants*

This are treated as cases of single mitigant mapped to single or multiple exposures for the identification of the mitigant which has to be assigned to the exposures. Then, the treatment pertaining to single exposure mapped to multiple mitigants have to be followed to yield the credit risk weighted exposure amount.

Using the above logic, the application calculates the factor of exposure covered by the mitigant and the factor of the exposure uncovered (without any protection).

- Sec 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, and 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.

$$\text{Post-CRM RWA} = \text{Covered Amount} * \text{Risk Weight of the Mitigant} + \text{Uncovered Amount} * \text{Risk Weight of the Exposure}$$

This logic is handled in Sec Post-CRM RWA computation sub process.

All the below sub process and tasks are handled in the "SEC\_STD" Process – Sec Reclassification, Mitigant Reclassification, Sec STD Pre-CRM Computation, Risk Weight Assignment, Pre-CRM RWA Computation, Mitigant Eligibility, Mitigant Risk Weight, Haircut Assignment, Allocation of Mitigants to Exposures and Post CRM RWA Computation

### **Key Data Elements**

A few key data elements for Securitization computation is as follows. For a complete list of tables and columns refer to the Download Specifications document.

#### ***Securitization Exposures***

- The Key attributes required at securitization exposures table are as follows: Due Diligence Indicator, commercial real estate indicator, first loss tranche indicator, Securitization Exposure Amount, Securitization pool identifier, Undrawn amount, and Product Code

#### ***Securitization Pools***

- The Key attributes required in the securitization pool table are: Originative Prudential Requirement net Indicator, Clean Up Call option indicator, Implicit support indicator, Resecuritized indicator, and Pool Initial Exposure amount.

#### ***Mitigant Eligibility (Standardized Approach)***

- Eligible Mutual Fund Indicator, Main Index Equity Indicator, Equity Traded Indicator

#### ***Miscellaneous***

- All tranche information regardless of whether Bank has Exposure or not – required for inferring the ratings, credit enhancement level computation, eligibility of nth to default credit derivative mitigant
- Mitigant Value to be assigned at an Exposure level (not to the tranche)
- Mitigant Pool Id in the Exposure Mitigant Mapping table for nth to default mitigants – Required for eligibility of nth to default credit derivative mitigant
- Attachment point of tranches based on original balances – Required for eligibility of nth to default credit derivative mitigant

### **Assumptions**

As per RBI Basel III, the excess seller's interest is computed as amount above 20% of the total securitized instruments issued. It is assumed that the amount captured under the 'Initial Pool Exposure Amount' attribute on the Securitized Pool table is assumed to reflect the total sec instruments issued amount.

## ***7.3 Market RWA***

The Market Risk Capital Charge is expected to cater to the following trading book portfolio information of an Indian bank:

- Securities included under the Held for Trading category
- Securities included under the Available for Sale category
- Open gold position limits
- Open foreign exchange position limits
- Trading positions in derivatives
- Derivatives entered into for hedging trading book exposures.

The guidelines have been issued for the Standardized approach only.

## **Standardized Approach**

In the Standardized Approach (STD Approach), the Market Risk Capital Charge needs to be calculated for the following instrument types:

- Interest Rate related instruments (IR Instruments)
- Equity Position Risk
- Foreign Exchange risk
- Options
- Credit Default Swap in Trading Book

### **Pre-requisite for Market Risk Processing**

Execution of the Run, **Staging Data Population - Market Risk - RBI Standardized Approach** is usually a onetime activity. This should be executed once before actual Market Risk Run is executed. The following tasks are populated when the Run is executed.

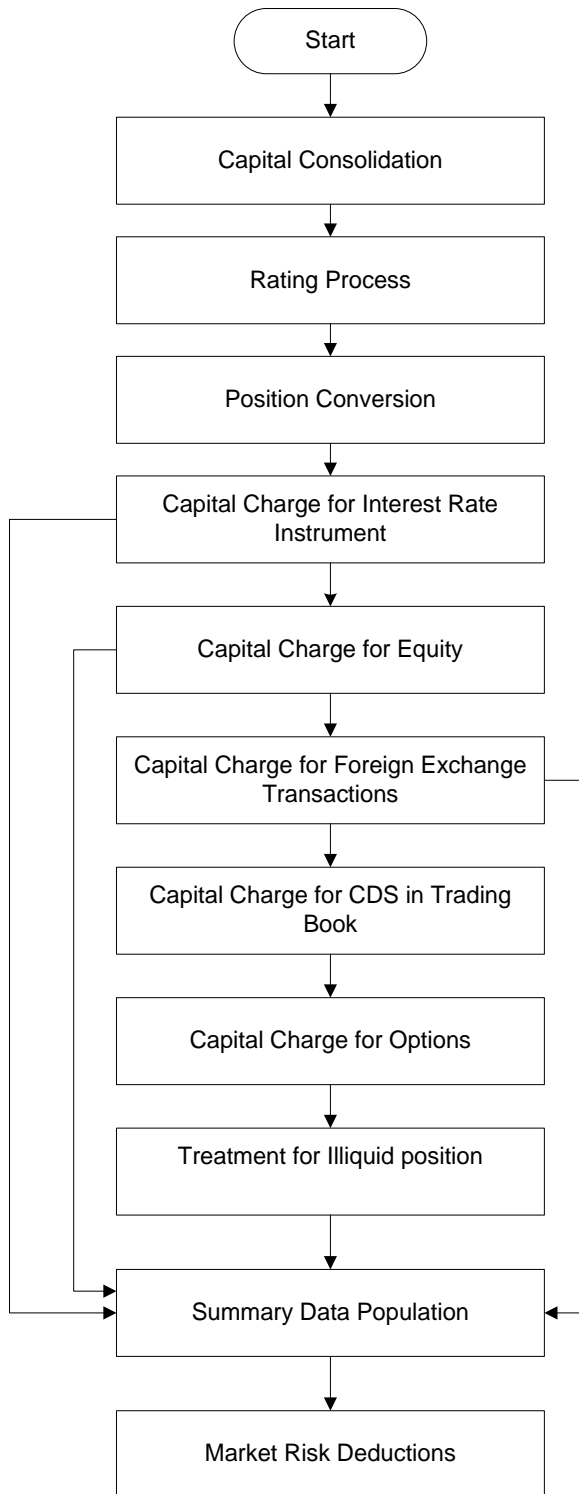
- IRC Data
- Market prices of the instruments
- Bank positions

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 flows into the fact table for further processing. For IR instruments the interest rate required is captured in IRC Rate History (**STG\_IRC\_RATE\_HIST**) table. This data flows into the fact table for further processing. This data is required for term structure that is used in Modified Duration and Greeks parameter calculation for options.

### **Process Flow for Market RWA**

The RWA computation for Market Risk for the Indian jurisdiction is computed under the process IND\_MKT\_RISK. In this process, RWA is computed for Interest Rate, Equity, FOREX, and Options. The process IND\_MKT\_RISK is mapped to the following pre-defined Run which computes Market RWA:

Run: **Risk Weighted Asset Calculation - Market Risk - RBI Standardized Approach**



- **Capital Consolidation:**

For a reporting bank the level at which the consolidation is processed is identified by the application. You can select Solo or Consolidation level for each entity in the rule present in the Capital Consolidation

process. This particular process handles entity level details. The entity data is captured in Legal Entity Details (**STG\_LEGAL\_ENTITY\_DETAILS**) table. All the child entities underlying a parent are considered for RWA consolidation. When consolidation is the level selected for a reporting bank, each child entity data is consolidated with the parent entity post entity shareholding percent multiplication.

For more information on the process and sub process that computes this task, refer the following:

*Process:* IND\_BASELIII\_CAPITAL\_CONSOLIDATION

*Sub-process:* Capital Consolidation Approach

### *Approaches Followed in Capital Consolidation*

The three approaches followed by the Capital Consolidation are:

**Consolidation Approach(CONSL):** Under this approach, all the entities of the bank's organizational structure are considered. This includes all the entities/subsidiaries that belong to the same jurisdiction. All the exposures of the entities in the organizational structure are considered for computing risk weighted exposures, except the intra-group exposures.

**Aggregation Approach(AGG):** This approach is similar to the Consolidation approach but is used in the cases, where some of the entities that are part of bank's organizational structure belong to a different jurisdiction. The capital requirement of the affiliate is computed as per the jurisdiction that it is subject to and is then aggregated with the rest of the group's capital requirement. Intra-group exposures are not excluded in this approach.

**Deduction Approach(DED):** This approach is used in the case where some of the subsidiaries/entities that are part of bank's organizational structure are excluded from consolidation. In such a scenario, the regulatory investment in the excluded subsidiary attributable to the rest of the group are deducted from the consolidated capital requirements.

- **Rating Process:**

Rating data is expected for all instruments which bear an interest rate risk. The rating data is reclassified into RBI equivalent standard rating and the standard rating is considered for assigning specific risk charge for interest rate instruments, wherever applicable. If there are multiple ratings for the same issue, then the application does a multiple assessment check as per the multiple assessment logic detailed in the RBI Basel III guidelines. This process assigns a RBI equivalent rating for an instrument, counterparty and/or issuer, based on the rating details available for the same, after applying multiple assessment logic.

For more information on the process and sub process that computes this task, refer the following:

*Process:* IND\_BASELIII\_CREDIT\_RATING\_PROCESSING

*Sub-process:* Credit Rating Data Population

- **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). The following information is required for position conversion: Long/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 is 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.
  - 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.
- In the case of options, the delta weighted values are processed for 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 will be 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 will be converted to two child positions which will be in zero specific risk securities. The exposure amount for each of these positions will be 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.
- For Credit Derivative Swap, the parent swap will be converted to two child positions, of opposite position. So if the Parent CDS is *Long*, its child position will be *Short*. One position will be zero specific risk security; the other will be debt security. The exposure of Zero specific risk security will be based on the Present Value of cash flows of Parent CDS. The exposure of Debt security will be equal to Notional of Parent CDS. Zero specific risk security will have only General Market Risk computed, where-as Debt security will have only specific risk computed.

### 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
- Gold Forward

#### Options / Structured Products

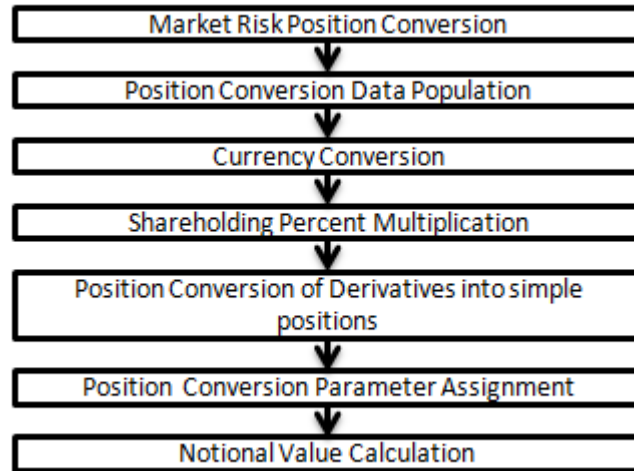
- Option on Equity
- Option on Currency
- Option on Commodity
- Option on Currency Future
- Option on Currency Forward
- Currency Swaption
- Option on a bond
- Option on a bond future
- Option on a Forward Rate Agreement
- Option on an Interest Rate Future
- Swaptions

#### Credit Derivative

- Credit Default Swap

#### Position Conversion Process Flow

The process flow of Market Risk Position Conversion is as follows:



**Position Conversion Data Population:**

The application populates **FCT\_MARKET\_RISK\_EXPOSURES** with the details given by the bank in **STG\_BANK\_POSITIONS** and **STG\_INSTRUMENT\_CONTRACT\_MASTER**. FOREX exposures of the bank are populated into **FCT\_MARKET\_RISK\_FOREX**. This exercise is processed for all the trading book exposures.

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK\_DATA\_PROCESSING

*Sub-process:* Market Risk Data Population

**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 refer the following:

*Process:* IND\_RBI\_III\_MKT\_RISK\_DATA\_PROCESSING

*Sub-process:* Currency Conversion

**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 the process and sub processes that compute this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK\_DATA\_PROCESSING

*Sub-process:* Shareholding Percent Multiplication

**Position Conversion of Derivatives into Simple Positions:**

The application takes the contract details from the 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. Therefore, 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.

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 further used for notional value calculation.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK\_POSITION\_CONVERSION

*Sub-process:*

- Position Conversion Options
- Position Conversion Basket Futures - Interest Rate
- Position Conversion Swaps
- Position Conversion Forwards and Futures
- IND Position Conversion CDS

**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 duration calculation for Duration Ladder Approach, calculation of Greeks for option charge, and so on.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK\_POSITION\_CONVERSION

*Sub-process:*

- Position Conversion Options
- Position Conversion Basket Futures - Interest Rate
- Position Conversion Swaps
- Position Conversion Forwards and Futures
- IND Position Conversion CDS

**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.

There is some dependency on different instrument types, like; the exotic options may further result into a vanilla option after position conversion, hence the position conversion should be processed in the following order of instrument types:

- Options
- Basket Futures
- Swaps
- Forwards/ Futures

After position conversion of basket futures instrument types, position offsetting on different positions of same kind of instrument types is processed and the post offset exposure amount is arrived at.

For each leg created from CDS instrument, Notional value is calculated differently. The exposure of Zero specific risk security will be based on the Present Value of cash flows of Parent CDS. The exposure of Debt security will be equal to Notional of Parent CDS.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK\_POSITION\_CONVERSION

*Sub-process:*

- Position Conversion Options
- Position Conversion Basket Futures - Interest Rate
- Position Conversion Swaps
- Position Conversion Forwards and Futures

**Example of a Forward Rate Agreement (FRA) Position Conversion:**

A purchased FRA may 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%. This 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 will have positions exactly opposite to the one given in the preceding example, that is, the long position will become short and short position will become long, with the value, maturity, and coupon remaining the same.

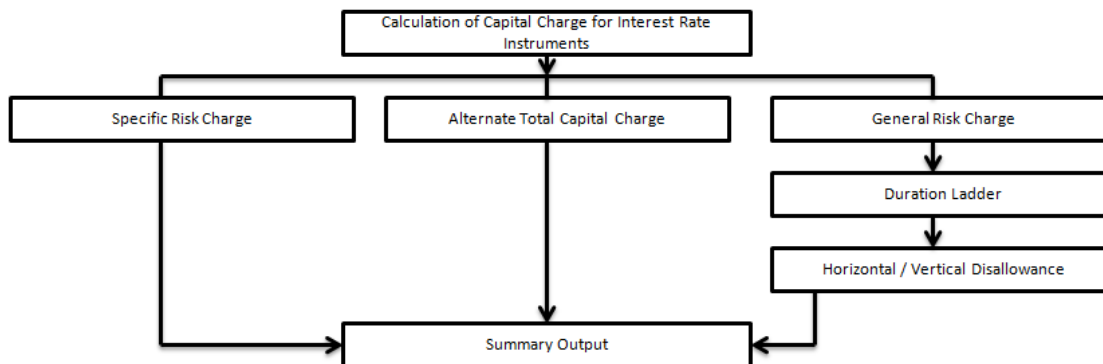
The actual discount rates for discounting the notional values of the two legs in the preceding example will be the interest rates pertaining to the respective maturities, that is, 3 months (long leg) and 6 months (short leg). For simplification purposes, an assumed rate of 5% is considered in the preceding example. The procedure followed by the application taking the preceding example into consideration, is as follows:

4. The FRA as contract is captured in the contract record details table with banks position in the contract in the position table. The application also captures the position mapping table for the above instrument type which is used for position conversion. For the preceding 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.
5. Both the position legs are reclassified into zero specific risk security.
6. The various contract parameters are assigned by the application to both the legs. Example: Coupon Rate, Maturity.
7. The Notional Value of both the legs is calculated as per the logic stated in the example.

- **Capital Charge Computation 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).

**Process flow diagram for Interest Rate Risk**



Specific Risk Charge:

Specific Risk Weight is assigned based on the issuer type rating, CET and CCB information of issuer and residual maturity for interest rate related instruments. This is assigned irrespective of the category of investments, whether they are ‘Available for sale’ (AFS) or ‘Held for Trading’ (HFT).

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Specific RW Assignment

Alternative Total Capital Charge:

RBI guidelines direct the banks to compute Alternative Total Capital Charge for the exposures in 'Available for Sale' (AFS) category. The application assigns Alternate Total Risk Weight to such exposures based on the issuer type, rating CET and CCB information of issuer and residual maturity.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Alternative Total RW Assignment

General Risk Charge:

General risk charge is calculated for each interest rate risk exposure for a reporting bank. General risk charge is calculated by following the Duration Ladder approach. This is processed irrespective of the category of investments, whether they are 'Available for Sale' (AFS) or 'Held for Trading' (HFT).

Note: The exposures which are Fully Deducted from CET 1, under Interest Rate Specific Risk Charge calculation, are excluded from General Risk Charge calculation.

Duration Ladder:

Under this method, the application creates time bands and based on 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 RBI guidelines for Market Risk.

Under Duration Ladder Approach, the application creates duration ladder based on modified duration calculated for each instrument. The general risk charge under duration ladder is calculated for each currency and insignificant positions across multiple currencies are populated 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 given by RBI guidelines on Market Risk. For Duration Based Ladder Approach, the application creates three time zones for each Modified Duration Time Band. This is computed in the process 'Time Band Assignment'. 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 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 the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Time Band Assignment
- Market Risk Assumed Rate Assignment
- Market Risk Weighted Position Calculation - Duration Approach

Horizontal/Vertical Disallowance:

In the application, vertical and horizontal disallowance for IR instruments is processed by using a Data Transformation function 'MR\_IR\_Duration\_Mat\_Ind' under 'Market Risk Generic Risk Charge Calculation' which 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 RBI guidelines for market risk. A detailed explanation of how the application handles the horizontal and vertical disallowance is as follows:

8. The application initially populates weighted long and weighted short position amounts for each time band.
9. The next step is to offset the matched positions and populate them as 'offset matched position within the time band'. The unmatched positions are populated as 'offset unmatched position within the time band'.
10. Offset unmatched positions arrived at from the above step are then taken up 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'.
11. 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, then for zones 2 and 3, and lastly for zones 1 and 3.
12. All the unmatched positions (within time band, same zone, between zones and net unmatched position) are multiplied by the factors listed in the RBI guidelines for duration ladder approach as applicable.

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Generic Risk Charge Calculation

*Procedure:* MR\_IR\_Duration\_Mat\_Ind

#### 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.

For Interest Rate reporting line, the total capital charge is computed by comparing the values of specific and general risk charge for AFS and HFT categories and the Alternate Capital Charge computed for AFS category. Based on the rules for comparison stated in the RBI guidelines, the population for the capital charge against the Interest Rate reporting line is processed by a Data Transformation 'MR\_IR\_Tot\_Cap\_Chrg\_Calc' by the application.

Finally, RWA is calculated in the market risk summary (**FCT\_MARKET\_RISK\_SUMMARY**) table by multiplying capital charge with (100/9). The interest risk charge is reported out of market risk summary (**FCT\_MARKET\_RISK\_SUMMARY**) table under Interest Risk charge reporting line.

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK

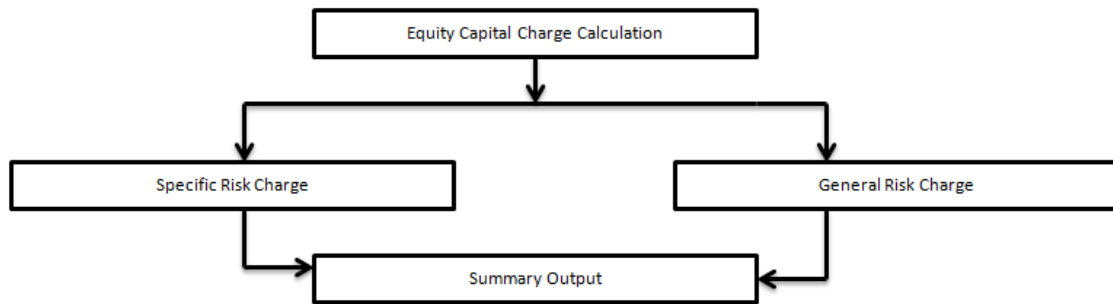
*Sub-process:*



- Market Risk Capital Risk Charge Calculation
- Market RWA Calculation

- **Capital Charge Calculation for Equities:**

The application calculates equity capital charge as summation of specific risk charge and general risk charge. The process flow for calculation of equity risk charge is as follows:



**Specific Risk Charge:**

Specific Risk Weight is assigned based on the issuer type, significant/ insignificant, regulatory capital details for equity related instruments. This specific risk weight is then multiplied by the post offset exposure amount to arrive at the specific risk charge. Delta weighted positions of equity options and is considered for specific risk computations.

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Specific RW Assignment Equity

The Specific Risk charge for Security Receipts is 13.50%.

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Market Risk Specific RW Assignment Equity
- Market Risk Specific Risk Charge Calculation

**General risk charge:**

The application assigns 9% 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 the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Market Risk General RW Assignment
- Market Risk Generic Risk Charge Calculation

Note: The exposures which are Fully Deducted from CET 1, under Equity Specific Risk Charge calculation, are excluded from General Risk Charge calculation.

Summary Output:

The equity risk charge is reported from the market risk summary (**FCT\_MARKET\_RISK\_SUMMARY**) table under equity reporting line. Specific and general risk for equity is also reported separately from the summary table.

*For more information on the process and sub process that computes this task, refer the following:*

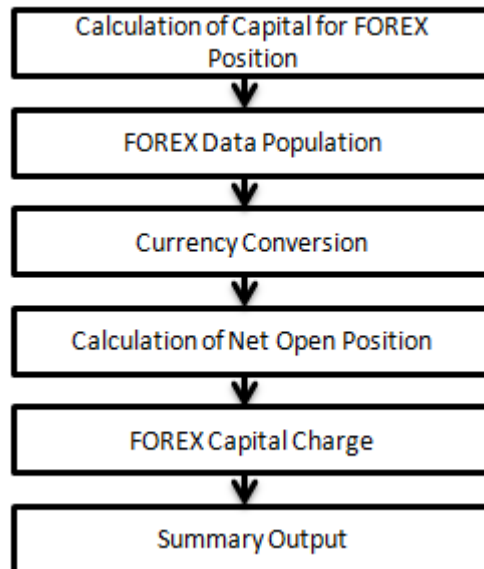
*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Market Risk Capital Risk Charge Calculation
- Market RWA Calculation

- **Capital Charge for Foreign Exchange Transactions:**

Process Flow diagram for Foreign Exchange Transactions



FOREX Data population:

All foreign exchange exposure data is expected at a net level by each currency in a separate table meant only for FOREX exposures data (**STG\_FOREX\_EXPOSURES**). Forward currency position, asset, liability, accrued interest, profit and loss, structural position, and so on, in different currencies are captured separately in the FOREX exposure table. This data is then populated to **FCT\_MARKET\_RISK\_FOREX** which is a dedicated table to compute FOREX capital charge.

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_RISK\_DATA\_PROCESSING

*Sub-process:* Market Risk Data Population

Currency Conversion:

Currency conversion of FOREX positions to reporting currency is done in the application in the following rules:

- FOREX Position Profit and Loss Attribute Natural CCY Conversion to Reporting CCY
- FOREX Position Attribute Natural CCY Conversion to Reporting CCY
- FOREX Position Other Attribute Natural CCY Conversion to Reporting CCY

This conversion is processed based on the exchange rate between the natural currency of the exposure and the reporting currency.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Gamma and Vega Capital - Delta Plus Method

Calculation of Net Open Position:

The net open position is the maximum value of the net long and net short position across all currency exposures plus the value of gold. This is computed under the process 'Market Risk FOREX Risk Position Calculation' in the application.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk FOREX Risk Position Calculation

FOREX Capital Charge:

The application applies the short hand method for FOREX risk charge calculation by treating all the currencies to be same and applying 9% risk charge on net open position.

This is done by the data transformation 'MR\_Cap\_Chrg\_Frx\_Ind'.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Capital Risk Charge Calculation

Summary Output:

The FOREX risk charge gets reported out of market risk summary table under FOREX charge reporting line.

***For more information on the process and sub process that computes this task, refer the following:***

Process: IND\_RBI\_III\_MKT\_RISK

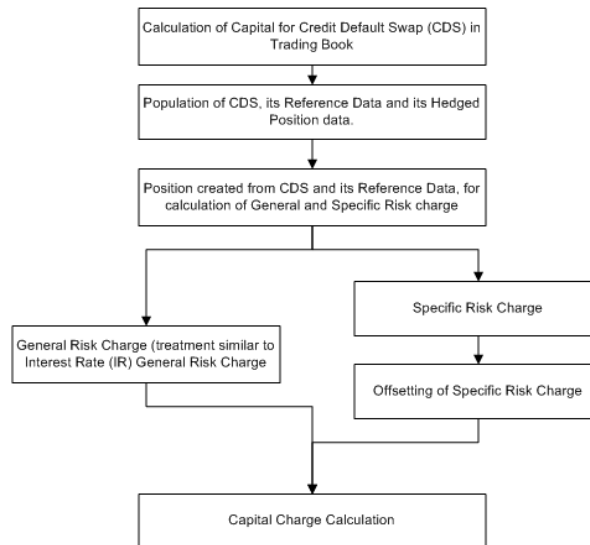
Sub-process: Market RWA Calculation

- **Capital Charge for CD's in Trading Book**

Credit Default Swap (CDS) is a financial instrument, used to hedge counterparty credit risk. The total risk charge for CDS instruments consists of specific risk charge (specific to the Issuer and Instrument) and general risk charge (market related risk vested in the instrument).

CDS Parent instrument is converted into two Child position, each position is specific to Specific Risk and General Risk charge computation. Details of Position conversion is mentioned in Section- Position Conversion.

Process flow diagram for Capital Charge for CDs in trading book is shown below:



### Specific Risk Charge:

Specific Risk is calculated for Child Debt security position created from Parent CDS.

Specific Risk Weight is assigned based on the issuer type, rating, residual maturity of the reference asset/obligation and residual maturity of the parent CDS. This specific risk weight is then multiplied by the post offset exposure amount to arrive at the specific risk charge. Post offset amount is derived from Parent CDS Notional amount.

Specific Risk charge is different if the reference asset/ obligation issuer type is NBFC-ND-SI (Non-deposit Taking Systemically Important Non-Banking Financial Companies) or Commercial Real Estate Companies. Wherever the issuer type is NBFC-ND-SI or CRE, data needs to be provided in table stg\_party\_master column v\_type

After Specific Risk charge is applied, if the Parent CDS is used for Hedging, there is offset to the Specific Risk charge.

If the Parent CDS is not used for Hedging, there is no offset done to Specific Risk charge.

*For more information on the process and sub process that computes this task, refer the following:*

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Specific RW Assignment CDS

**General Risk Charge:**

General risk charge is calculated for Zero Specific Risk Child position created from Parent CDS. General risk charge is calculated by following the Duration Ladder approach, similar in line with General Risk of IR instrument. Duration Ladder approach is already detailed in Section- Duration Ladder under Section- Capital Charge Computation for Interest Rate Instruments.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Market Risk Weighted Position Calculation - Duration Approach
- Market Risk Generic Risk Charge Calculation

**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.

The output is populated in CDS Reporting Line. There is separate output for General Risk and Specific Risk.

Finally, RWA is calculated in the market risk summary (FCT\_MARKET\_RISK\_SUMMARY) table by multiplying capital charge with (100/9). The interest risk charge is reported out of market risk summary (FCT\_MARKET\_RISK\_SUMMARY) table under Interest Risk charge reporting line.

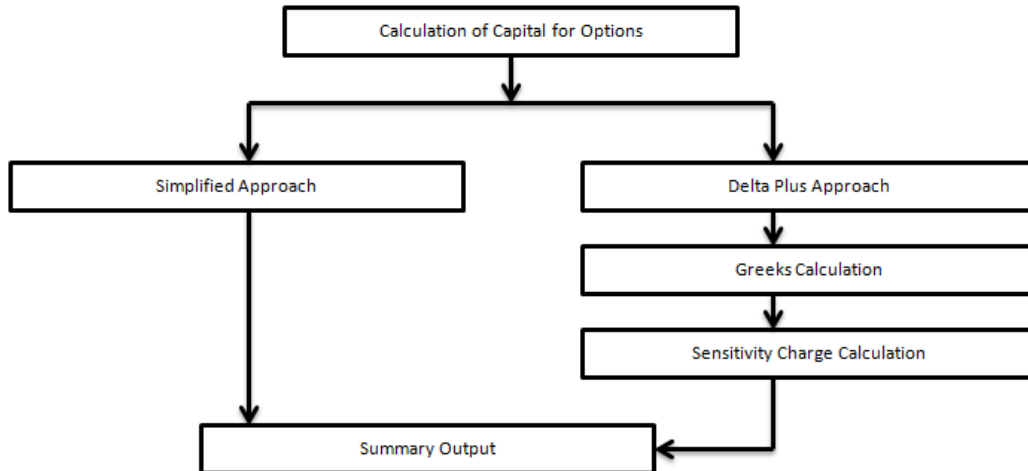
***For more information on the process and sub process that computes this task, refer the following:***

Process: IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Market Risk Capital Risk Charge Calculation
- Market RWA Calculation

- **Capital Charge for Options:**



### Simplified Approach:

In the Simplified Approach, for option type being long cash and long put or short cash and long call, the application calculates ‘in the money’ values for the option. In case of ‘in the money’ option, the value is calculated as the number of units multiplied by the difference of underlying forward price and strike price, if the residual maturity of the option is greater than 6 months. In the case of the residual maturity of the option contract being less than or equal to 6 months the ‘in the money’ value is calculated as number of units multiplied by the difference of underlying current market price and strike price.

The Capital Charge is arrived at as the difference between sum of general risk and specific risk on the underlying value and ‘in the money’ value of the option. For long put or long call, the application applies the capital charge as the least of the sum of general risk and specific risk on the underlying and option premium value.

This computation is processed in the task ‘Market Risk Options – Capital Charge Calculation – Simple Approach’

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Market Risk Generic Risk Charge Calculation - Simple Approach
- Market Risk Capital Risk Charge Calc - Simple Approach

### Delta Plus Approach:

In the Delta Plus Approach, the option taken on any underlying contract is processed for position conversion. The purpose of position conversion is to create multiple positions with delta weighted amounts and send each position for respective capital charge calculation.

### Greeks Calculation:

The application calculates Greeks for options based on the option contract information. The Greek calculation involves calculating implied volatility, delta, gamma and vega. Each of the Greeks calculated then participates in sensitivity charge calculation.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- Market Risk Gamma Impact - Delta Plus
- Market Risk Gamma and Vega Capital - Delta Plus Method

#### Sensitivity Charge Calculation:

For options, total charge includes underlying capital; charge plus sensitivity risk charge. Sensitivity risk charge includes delta risk, gamma risk, and vega risk charge. The formula used against each of the sensitivity charge is as per RBI guidelines on Market risk.

The computation of Delta weighted positions and Gamma impact for options is done under the process 'Market Risk Options – Delta and Gamma calculations – Delta Plus Approach'. The delta weighted positions of options participate in the specific and general risk charge computations applicable for the respective underlying.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Capital Risk Charge Calculation - Delta Plus

#### Summary Output:

The capital charge for option is reported from summary table where reporting line is options where as the underlying risk charge gets reported under the respective reporting line.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk RWA Calculation

- **Treatment for Illiquid Positions:**

RBI guidelines for treatment for Illiquid Positions have the following consideration:

1. Valuation Adjustments for less Liquid Derivatives Positions.
2. Valuation Adjustment for less Liquid or Illiquid Positions.

#### **Valuation Adjustments for Derivatives Portfolio**

Valuation adjustment is done for Derivative products. Its value is market to market or, which is hold in trading book. These are applicable for Market Risk calculation.

The valuation which are needed to be adjusted or deducted are-

4. Incurred CVA Losses
5. Closeout costs

6. Operational Costs
7. Early termination, investing and funding costs
8. Future administrative costs
9. Model risk, if appropriate.

All valuation details are expected as download at the contract level. Incurred CVA Losses, Adjustment to MTM (which include adjustment due to Closeout costs, Operation Costs, Early termination, investing, funding cost, Future administrative costs, model risk), and Other valuation adjustment, if any. All this adjustment mentioned will be deducted from CET1.

#### **Valuation Adjustment for less Liquid or Illiquid Positions**

Valuation adjustment done for Illiquid positions (or contracts), are deducted from CET1, instead of debiting it to Profit and Loss Account.

Valuation adjustment done for Derivative products, has the following considerations-

- a. Identification of Illiquid contracts.
- b. Identification of Derivative contracts.
- c. Capturing of Incurred CVA Losses.
- d. Capturing of Other MTM adjustment.
- e. Capturing of any other Adjustment.
- f. Deduction of Incurred CVA Losses, Other MTM adjustment, and any other adjustment from CET1.

Adjustment MTM, other adjustment values and Incurred CVA losses, are populated separately for Illiquid positions. MTM value populated for illiquid position is net of these values (Adjustment MTM, Other adjustment values and Incurred CVA losses).

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:*

- o Market Risk Deduction From CET1
- **Market Risk Deductions from CET1**

Deduction items captured in IR, Equity Specific Risk and Illiquid Position, is deducted from CET1.

***For more information on the process and sub process that computes this task, refer the following:***

*Process:* IND\_RBI\_III\_MKT\_RISK

*Sub-process:* Market Risk Deduction from CET1

The sub-process takes the CET1 value, stored in fct table and deducts the new formed capital heads with values from CET1, and updates CET1 with deducted amount.

#### ***Key Data Elements***

Key data elements are listed in this section. For a complete list of tables and columns to be populated refer to the Download Specification document.

- Interest Rate Historical Data: Interest Rate information for IR instrument is stored here.



- Bank Positions: Position in the instrument (Long/Short), Price of Instrument and No of Units for OTC instruments are stored here.
- Market Instrument Contract: Price of Non-OTC instruments is stored here.
- Instrument contract: Instrument Type, Counter party type, currency code, coupon rate, effective date, maturity date, strike price, coupon rate, coupon frequency are stored here.
- FOREX Exposures: Exposure amount, asset amount, asset accrued interest, asset accrued profit are stored here.

## 7.4 Operational RWA

As per the Basel accord, “Operational Risk is the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events”. External losses can occur due to theft of information or hacking of systems. The RBI guidelines have prescribed one method for calculating Operational Risk (OR) Capital Charge which is as follows:

- Basic Indicator Approach

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**NOTE:** While executing Solo Run for computing Operational Risk, the parent entity data is processed. However, for a Consolidated Run the parent entity as well as the subsidiary data is processed.

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### Basic Indicator Approach

To calculate the capital charge under the Basic Indicator Approach, the annual gross income for each of the past three years for a standard line of business is multiplied by a fixed percentage of 15%. The average is considered to calculate the capital charge. If the annual gross income is negative or zero in any of the past three years, then the value from the numerator is excluded thereby reducing the base denominator by the same count.

The capital charge formula is as follows:

$$K_{BIA} = \left[ \sum (GI_{1..n} \times \alpha) \right] / n$$

Where:

KBIA = the capital charge under the Basic Indicator Approach

GI = annual gross income, where positive, over the previous three years

n = number of the previous three years for which gross income is positive

$\alpha$  = 15 per cent, which is set by the BCBS, relating the industry wide level of required capital to the industry wide level of the indicator.

## Process Flow for Operational RWA

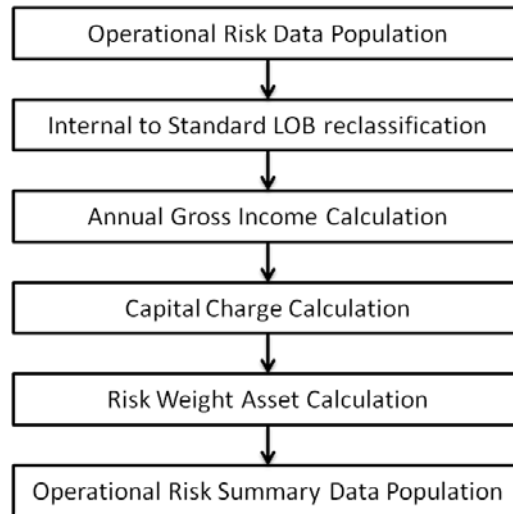
### Prerequisite

Before calculating the capital charge for OR, the following should be computed as a prerequisite:

In the process **IND\_OPS\_RISK**, the task defined as **Opr\_Risk\_Capital\_Charge** should mention the number of years (in the past) as a parameter for capital calculation.

For example: if the previous 3 years are considered, then assign 3 as a parameter against the task **Opr\_Risk\_Capital\_Charge**. Therefore, in the future if the previous 4 years have to be considered, then change that particular parameter only.

The process to compute OR under the Basic Indicator Approach are as follows:



- **Operational Risk Data Population:**  
The input data for each of the financial years mapped, along with the internal line of business are populated in the processing table.
- **Internal LOB to Standard LOB Reclassification:**  
The internal lines of business are reclassified into standard lines of business.
- **Annual Gross Income Calculation:**  
For each of the standard lines of business and for each financial year, the annual gross income is calculated.
- **Capital Charge Calculation:**  
Capital charge is calculated by multiplying the alpha value with the annual income of each year across each standard line of business. Further, the average of 3 years is considered (if the values of all the 3 years are positive). If the values of all the 3 years are not positive, then zero or the negative value from both numerator and denominator are excluded.
- **Risk Weight Asset Calculation:**  
The capital charge value obtained is then converted to the equivalent RWA value by multiplying with the factor 100 divided by 9.
- **Operational Risk Summary Data Population:**  
The RWA amount is populated into the Operational Risk Summary (**FCT\_OPS\_RISK\_SUMMARY**) table along with the entity for which the OR RWA is calculated. The application converts all the elements in the annual gross income and loan and advance amount reported in their respective national currency, to the reporting currency. While calculating annual gross income or loan and advance amount for the subsidiary that are part of regulatory consolidation, the amount is limited to the share-holding percentage. Hence, a subsidiary which is part of regulatory consolidation and parent holding in the subsidiary is considered as 45%, then the amount limited to 45% is considered for gross calculation. Similarly, if the holding is more than 50%, then the entire amount is considered for gross calculation.

## Key Data Elements

Key data elements need to be noted are listed in this section. To view the complete list of tables used, see the

Download Specification document.

- Entity details which are part of regulatory consolidation and parent entity share holding percent is required. This data is captured in 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, Insurance Irregular Gain, Net Write-off Amount, Reversed Provision Amount, Reversed Write-off Amount, Disposable Property Income Legal Settlement Income, and Insurance Claim Income for each line of business and for each financial year, is required.

## *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 had prescribed a new definition of capital to strengthen the global capital framework under Basel III. RBI came up with Basel III to calculate the total capital for the Indian banks, as well as, the Foreign banks branches in India.

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

- Tier1 capital
  - Common Equity Tier 1 Capital for Indian Banks
  - Common Equity Tier 1 Capital for branches of Foreign Banks in India
  - Additional Tier 1 Capital for Indian Banks
  - Additional Tier 1 Capital for branches of Foreign Banks in India
- Tier 2 capital
  - Tier 2 Capital for Indian Banks
  - Tier 2 Capital for branches of Foreign Banks in India

Each component of capital is subject to restrictions where CET1 must be at least 5.5% of total risk-weighted asset. Tier 1 capital must be at least 7.0% of total risk-weighted asset. Total capital must be 9.0% of total risk-weighted asset. Each component of capital undergoes minority interest and regulatory adjustments. The minority interest is applicable for a bank only. Most of the regulatory adjustment line items are to be deducted from CET1.

For a bank, the accounting entity that are not part of regulatory consolidation, the investment amount is partly deducted from its respective component of capital and is partly risk weighted as per banking or trading book rules.

Securitization transaction and non-DvP and non-PvP transaction items, which were formerly as per Basel II, deducted 50% from Tier 1 and 50% from Tier 2 are instead risk weighted at 1111%. All the regulatory adjustment line items will follow a phase-in arrangement from the beginning of 2014 till 2017.

In particular, the regulatory adjustments begins at 20% of the required adjustments to Common Equity Tier 1 on 31<sup>st</sup> March 2014, 40% on 31st March 2015, 60% on 31st March 2016, 80% on 31st March 2017, and reaches 100% on 31st March 2018. The same transition approach applies for all deductions from additional Tier 1 and Tier 2 capital.

Capital Structure process takes inputs from Fact Non Sec Exposures (**FCT\_NON\_SEC\_EXPOSURES**) and Market Risk Exposures (**FCT\_MARKET\_RISK\_EXPOSURES**). Capital Structure process is positioned between Market Risk data processing (**BASELIII\_MKT\_RISK\_DATA\_PROCESSING**) and Market Risk position conversion (**BASELIII\_MKT\_RISK\_POSITION\_CONVERSION**) due to the following reasons:

- The significant and insignificant investment deductions involve splitting of certain exposures into multiple exposures (2 new exposures and deletion of the parent exposure). These split exposures should be position converted and RWA is calculated on these position converted exposures.
- After processing of Market Risk, the calculated RWA is populated to Market Risk Summary (**FCT\_MARKET\_RISK\_SUMMARY**) which contains the aggregated record for each instrument type. If Market Risk is processed before Capital Structure processing, then the RWA has to be adjusted for the split exposures for the Market Risk record and this task will be repeated for each record.

If the RWA for the split exposures is adjusted, then it will be approximate in case the RWA is pro-rated between instrument types. The same tasks are repeated (falling into cycles) if RWA is computed in this table again.

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**NOTE:** All the GL line items are expected at Solo level for each entity. The consolidated data will be discarded.

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 as well as the subsidiary data is considered. Regulatory Investment data to financial institutions which are part of regulatory consolidation is treated as an internal transaction. Those subsidiaries which are outside the scope of consolidation are treated as per insignificant and significant rule.

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For Indian banks, a task to compute the eligible amount of 'Profits in current financial year' that are eligible to be included in the CET1 capital is present. This task requires additional data at the Entity level that is captured at Stage Legal Entity Details and Fact Entity Information table. Below are the additional information captured at the entity level:

- Net profit up to the current quarter (NPt). The value of 't' varies from 1 to 4.
- Average annual dividend paid during last three years (D)
- Eligibility option of 'Y' or 'N' to include current quarter profit in CET1. The eligibility option indicates that the incremental provisions made for non-performing assets at the end of any of the four quarters of the previous financial year have not deviated more than 25% from the average of the four quarters.

This task computes the eligible amount EPt as:

$\{NPt - 0.25 * D * t\}$ : Where eligibility option is 'Y'

0: Where eligibility option is 'N'

Total of EPt for all entities that are marked for consolidation is populated on FCT\_CAPITAL\_ACCT\_HEAD under the CAP head ('Eligible profits in current FY – CET1'), added to capture this amount.

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**NOTE:** For the purpose of computing eligible quarterly profits, value of 't' on the last day of the quarter is inclusive. That is, it is considered that the quarter has ended. For example, on 30<sup>th</sup> September the t value used will be 2. Similarly, t value on 31<sup>st</sup> March will be set as 4.

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The sub processes and rules within Market Risk Data Processing process **IND\_RBI\_III\_MKT\_RISK\_DATA\_PROCESSING** perform the following tasks:

- The Rules within the sub process **Market Risk Currency Conversion** converts the amount attributes, which are in natural currency to reporting currency, which is used for further processing. Attributes like the exposure amount, margin amount, MR notional amount, and so on are processing for currency conversion from natural currency to reporting currency.

- The Rule **Mkt Risk Instrument type to Capital Comp Group Reclassification** in the sub process **Market Risk Reclassification** within **IND\_RBI\_III\_MKT\_RISK\_DATA\_PROCESSING** re-classifies Market Risk instrument data into the various Capital Component Groups such as CET1, AT1.
- The re-classified instruments are further processed for identification of Regulatory Entity Internal Transaction, Reciprocal Cross-Holding, Own Shares - Treasury Stock, and Significant Investment in Non Reg Consl Entity transaction. The following Rules in the **Market Risk Capital Consolidation Calculations** sub process identify these transactions:
  - Cap Consl - MR Deduction of Regulatory Entity Internal Transaction
  - Cap Consl - MR Basel III Deduction of Reciprocal Cross-Holding
  - Cap Consl - MR Deduction of Own Shares - Treasury Stock
  - Cap Consl - Mkt Risk Deduction of Significant Investment in Non Reg Consl Entity

## **Assumption**

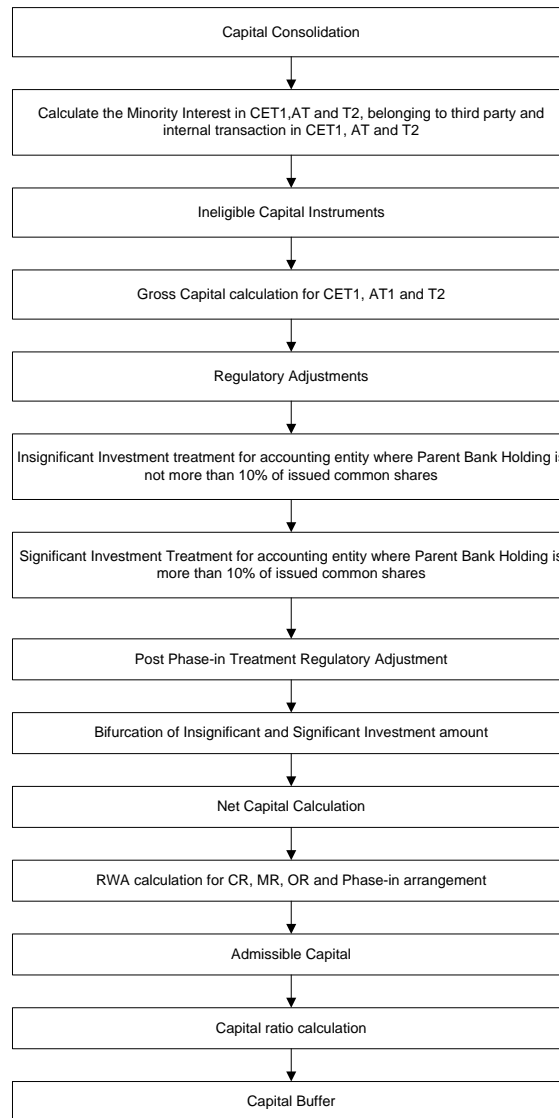
The regulatory adjustment that follows a phase-in arrangement and not deducted from CET1, needs to follow national treatment as per RBI III accord. Hence, the assumption is that the regulatory adjustment line item follows Basel II accord. Items which were formerly deducted from 50%-50% from Tier 1-Tier 2 capital are deducted from AT1 and capital investment instrument not deducted from CET1 will be risk-weighted at 100%.

Since investments in accounting entities (which are outside the scope of regulatory consolidation) by parent bank are long-term investments and mostly equity related instruments, 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**).

## **Process Flow for Capital Structure**

Capital Structure is executed along with Capital Consolidation and Credit RWA process. For arriving at the capital structure, the minority interest is found out, ineligible capital instruments are identified, gross capital is calculated, adjustments for regulatory purposes are made, insignificant adjustments are also made, phase in treatments are brought in, and finally the net capital is calculated. Following block diagram illustrates the process and subsequent section details each of the blocks depicted in the block diagram.



- **Surplus of Minority Interest:**

Minority Interest as per the RBI Basel III guidelines 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 calculated as the third party's interest (share holding 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** in **BASELIII\_CAPITAL\_STRUCTURE** process covers the above processing. The RBI specific data is captured in the table, **FSI\_SETUP\_CAPITAL\_HEAD**.

The deduction also includes internal transactions in each tier of capital among the various entities which are part of the regulatory consolidation. Hence, minority interest attributed to third party as well as the internal transactions in each tier of capital is deducted from the gross capital of each tier of capital.

RBI says the minimum required CET-1, Tier -1 capital, Total capital ratios, that is (8.0%, 9.5% and 11.5%) used as the basis for computing the surplus capital for minority interest will not be phased-in. while for other jurisdiction these minimum required capital percent receive phase-in treatment.

- **Ineligible Capital Instruments**

Capital instruments which no longer qualify as non-common equity Tier 1 capital or Tier 2 capital (for example, IPDI and Tier 2 debt instruments with step-ups) are considered as Ineligible Capital Instruments and are phased out beginning January 1, 2013. After fixing the base at the nominal amount of such instruments outstanding on January 1, 2013, their recognition is capped at 90% from January 1, 2013, with the cap reducing by 10 percentage points in each subsequent year. This cap is applied to Additional Tier 1 and Tier 2 capital instruments separately and refers to the total amount of instruments outstanding which no longer meet the relevant entry criteria. To the extent an instrument is redeemed, or its recognition in capital is amortized, after January 1, 2013, the nominal amount serving as the base is not reduced.

Previously eligible capital items subject to phasing is captured at instrument level and the appropriate amount eligible to be included in the relevant capital tier during the transition period is computed at the instrument level itself. The total eligible item are aggregated and populated on Standard Account Head Fact table for the below Capital heads:

- Total Non-qualifying capital instruments subject to phase-out from Additional tier 1 capital
- Total Non-qualifying capital instruments subject to phase-out from Tier 2 capital

Once the data is populated on the Standard Account Head Fact table, the same is classified into the appropriate capital component.

Following are the steps in the process:

1. Details of all ineligible capital instruments, which are eligible under the current Basel II regulations such as IPDI and Tier 2 debt instruments with step-ups are captured under the below tables:
  - Stage Issued Instrument Positions (STG\_ISSUED\_INSTR\_POSITIONS)
  - Stage Instrument Contract Master (STG\_INSTRUMENT\_CONTRACT\_MASTER)
2. The Data captured is moved to the respective Fact and Dimension table below:
  - Fact Issued instrument Positions (FCT\_ISSUED\_INSTR\_POSITIONS)
  - Instruments Contracts Dimension (DIM\_INSTRUMENT\_CONTRACT)
3. The eligible amount included as part of Basel III capital structure is computed and stored in the Fact Issued Instrument Positions table under attribute 'Amount Recognized in Regulatory Capital'.
4. The eligible capital computed amount is aggregated and added on Fact Standard Account Head table under the below Capital heads:
  - Total Non-qualifying capital instruments subject to phase-out from Additional tier 1 capital
  - Total Non-qualifying capital instruments subject to phase-out from Tier 2 capital

***Assumptions:***

As per the Phase In treatment flow and details available in the RBI Basel III Master Circular for instruments issued before 12<sup>th</sup> Sep 2010, treatment of exposure depends on the Call exercise date. It is assumed that the Call referred in the circular is the first call available post instrument issue.

- **Gross Capital Calculation for CET1, AT1, and T2:**

For Gross Capital calculation all the components are classified into their respective tiers (CET1, AT1, and T2) based on their purpose. 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.

### **Revaluation Reserves**

These reserves often serve as a cushion against unexpected losses, but they are less permanent in nature and cannot be considered as 'Core Capital'. As per RBI, all Revaluation Reserves at a discount of 55% is included as part of Tier 2 capital.

### **Capping of General provisions amount included on T2 Capital under Standardized approach**

General Provisions on Standard Assets, Floating Provisions, Provisions held for Country Exposures, Investment Reserve Account, excess provisions which arise on account of sale of NPAs and countercyclical provisioning buffer qualifies for inclusion in Tier 2 capital. However, these items together are admitted as Tier 2 capital up to a maximum of 1.25% of the total credit risk-weighted assets under the standardized approach.

Eligible provisions amount is computed as part of the rule 'CS - Basel III General Provision for Standardized' and is stored under the existing Capital head 'General provision for Standardized Approach'.

### **Shortfall of Stock of provision to Expected Loss**

Any shortfall of Stock of Provision (General Provision) to Expected Loss under the IRB approach is deducted from the CET1 capital. Where, the total expected loss amount is less than total eligible provisions, banks are permitted to recognize the difference under Tier 2 capital up to a maximum of 0.6% of credit-risk weighted assets calculated under the IRB approach.

- **Regulatory Adjustment**

The regulatory adjustments and deductions are applied to the following capital both at Solo and at Consolidated levels.

Goodwill and other intangibles, DTAs, cash flow hedge reserve, gain on sale of securitization transaction, cumulative gain and losses due to change in own credit risk, defined pension fund asset are direct downloads (in **STG\_GL\_DATA** table). The General Provision is obtained as a download in the **Stage General Ledger Data (STG\_GL\_DATA)** table. All the DTLs related to phase line items are expected as download in the **STG\_GL\_DATA** table. The application calculates the values net of DTL and then processes it for the Regulatory Adjustments. This amount is prorated between the standardized approach and the IRB approach. This is processed using the **Provisions and Gross Capital Calculations** sub process. As per RBI, "Defined Benefit Pension Fund Assets and Liabilities" includes other defined employees' funds also. Bank needs to provide the data for this line item as inclusive of other defined employees' funds.

### **Goodwill and Other Intangible assets**

Goodwill and all Others Intangible assets is deducted from Common Equity Tier1 (CET1) capital including any goodwill, that is included in the valuation of significant investment in the BFSI entities which are outside the scope of regulatory consolidation. The full amount that is deducted from CET1 is Goodwill and Intangible Asset net of Deferred Tax Liability.

Operating losses in the current period and those brought forward will also be deducted from CET1 Capital

The data in the below Capital heads are provided as direct download:

- Goodwill
- Deferred Tax Liability related to Goodwill
- Other Intangible Assets
- Deferred Tax Liability related to Other Intangible Asset
- Losses brought forward and losses in the current period



**Deferred Tax Assets (DTA)**

The DTAs computed are deducted from Common Equity Tier 1 capital and includes:

- (a) DTA associated with accumulated losses
- (b) The DTA (excluding DTA associated with accumulated losses), net of DTL, where the DTL is in excess of the DTA (excluding DTA associated with accumulated losses). The excess shall neither be adjusted against item (a) nor added to Common Equity Tier 1 capital.

DTAs are captured under the below break-up amounts:

- DTA associated with accumulated losses
- Other DTA (excluding DTA associated with accumulated losses)

DTL is permitted to be netted off only against the 'Other DTA' amount. Any Excess DTL is not permitted to be offset against 'DTA associated with accumulated losses' nor to be added to the CET1 capital.

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NOTE: If the DTA (net of DTL) has a negative value then, the line item will not follow the phase-in treatment. Only positive value will go for transitional arrangement.

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**Cash Flow Hedge Reserve**

The amount of the net cash flow hedge reserve which relates to the hedging of items that are not fair valued on the balance sheet (including projected cash flows) is de-recognized in the calculation of Common Equity Tier 1. This means that positive amounts are deducted and negative amounts are added.

Data in the below Capital heads are provided as direct download:

- Cash Flow Hedge not fair valued (Asset)
- Cash Flow Hedge not fair valued (Liability)

The Final amount which is derecognized from Capital is computed by the rule 'CS - Net Cash Flow Hedge Reserve Calculation'.

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NOTE: If the Net cash Flow Hedge Reserve has a negative value then, the line item will not follow phase-in treatment. Only positive value will go for transitional arrangement.

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**Cumulative Gain and Losses due to change in own credit risk on Fair Valued financial Liabilities**

Banks derecognize all unrealized gains and losses that result from changes in the fair value of liabilities that are due to changes in the bank's own credit risk from the CET1. This means that positive amounts are deducted and negative amounts are added.

In addition, with regard to derivative liabilities, derecognize all accounting valuation adjustments arising from the bank's own credit risk. The offsetting between valuation adjustments arising from the bank's own credit risk and those arising from its counterparties' credit risk is not allowed. If a bank values its derivatives and securities financing transactions (SFTs) liabilities taking into account its own creditworthiness in the form of debit valuation adjustments (DVAs), then the bank deducts all DVAs from its Common Equity Tier 1 capital, irrespective of whether the DVAs arises due to changes in its own credit risk or other market factors. Thus, such deduction also includes the deduction of initial DVA at inception of a new trade. In other words, though a bank has to recognize a loss reflecting the credit risk of the counterparty (that is, credit valuation adjustments-CVA), the bank is not allowed to recognize the corresponding gain due to its own credit risk.

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NOTE: If the line item has a negative value then, the line item will not follow phase-in treatment. Only positive value will go for transitional arrangement.

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Treasury Stock and Reciprocal Cross Holding is calculated as the sum of pre-mitigation EAD - **N\_EAD\_PRE\_MITIGATION** in Fact Non Sec Exposures (**FCT\_NON\_SEC\_EXPOSURES**) and **N\_POST\_OFFSET\_AMOUNT** in Market Risk Exposures (**FCT\_MARKET\_RISK\_EXPOSURES**) where the **F\_TREASURY\_STOCK\_INDICATOR** is 'Y' and **F\_RECIPROCAL\_CROSS\_HLDG\_IND** is 'Y' respectively.

All the regulatory adjustment line items are deducted from its respective tier of capital post minority and internal transaction deduction.

- **Insignificant Adjustments**

Insignificant Adjustments include insignificant investments made by the bank, significant investments made the bank outside the scope of regulatory bodies, and reciprocal cross holdings.

**Insignificant Investments (Data Population and Deduction Assignment)**

All Insignificant investment exposures from Non-Securitization, Securitization and Market Risk Exposures table are sourced and stored in Non Regulatory Consolidated Entity FSI table. These exposures are then computed for the amount that needs to be deducted (that is, the total of all investments which are more than 10% of bank's own CET1 capital). The deduction percentage is captured and is used later to split the original exposures into the deduction and risk weighted legs. The Phase in transitional arrangement is also applied at this stage.

**Insignificant Investments (Splitting of Exposures)**

All Insignificant exposures are split into 2 legs, one pertaining to the Deduction, and another pertaining to Risk weighting.

**Significant Investment in the Capital of BFSI entities that are outside the scope of Regulatory Consolidation**

The regulatory adjustment applies to investment in the capital of banking, financial and insurance entities (the entities included are within the organization structure of the Parent for which consolidation is being calculated) that are outside the scope of regulatory consolidation where the bank owns more than 10% of the issued common share capital of the issuing entity or where the entity is an affiliate of the bank.

Investment include direct, indirect and synthetic holding of capital instrument. Holding in both banking book and trading book are also included. Underwriting position held for five days or less is excluded. If any capital instrument of the entity in which the bank has invested, does not meet the criteria for Common Equity Tier 1, Additional Tier 1, or Tier 2 capital of the bank, the capital is considered common shares for the purposes of this regulatory adjustment.

**Investment other than common shares**

The investment described above, that is, not common shares, is fully deducted, following a corresponding deduction approach. The deduction is applied to the same tier of capital for which the capital would qualify if it was issued by the bank itself.

**Shortfall of Capital**

If the bank makes a deduction from a particular tier of capital and it does not have enough of that tier of capital to satisfy that deduction, the shortfall is deducted from the next higher tier of capital (for example, if a bank does not have enough Additional Tier 1 capital to satisfy the deduction, the shortfall is deducted from Common Equity Tier 1).

**Investments which are common shares**

All significant investments which are common shares and which exceed 10% of the bank's Common Equity (after the application of all regulatory adjustments) is deducted while calculating Common Equity Tier 1 capital. The amount that is not deducted (upto 10% if bank's common equity invested in the equity capital of such entities) in the calculation of Common Equity Tier 1 is risk weighted at 250%.

Investments in both scheduled and non-scheduled commercial banks is deducted from CET1 or risk weighted at RW of higher than 250% based on the CET1+CCB ratio of the issuing bank.

**Investment in the Capital of the Banking, Financial and Insurance Entity that are outside the scope of regulatory consolidation and where bank does not own more than 10% of the Issued Common Share Capital of the entity**

The regulatory adjustment applies to capital of BFSI entities that are outside the scope of consolidation and where bank does not hold more than 10% of the issued common shares capital of the entity.

The issued common share of the entity includes investment of bank in the capital of entity either held directly, indirectly and synthetic holdings. Holding of such instruments in Banking book and trading book are to be included. But positions held for 5 working days or less can be excluded.

Sum up the total investment of the bank in various entity where holding of bank is less than 10 % of Bank's CET1. If the sum of total of all holding is more than 10% of bank's common equity (CET1-post minority and all regulatory adjustment) then the amount above 10% is required to be deducted using the corresponding deduction approach.

Accordingly, the amount deducted from common equity is calculated as the total of all holdings which in aggregate exceed 10% of the bank's common equity multiplied by the common equity holdings as a percentage of the total capital holdings. These results in a common equity deduction which corresponds to the proportion of total capital holdings held in common equity. Similarly, the amount deducted from Additional Tier 1 capital is calculated as the total of all holdings which in aggregate exceed 10% of the bank's common equity (as per above) multiplied by the Additional Tier 1 capital holdings as a percentage of the total capital holdings. The amount deducted from Tier 2 capital is calculated as the total of all holdings which in aggregate exceed 10% of the bank's common equity (as per above) multiplied by the Tier 2 capital holdings as a percentage of the total capital holdings.

The bank makes a deduction from a particular tier of capital if a particular tier of capital does not have enough capital to satisfy the deduction; the shortfall is deducted from the next higher tier of capital.

Investment below the threshold is risk weighted as per Standardized approach for Banking book whereas investments in the Trading book is handled as per market risk rules. For the application of risk weighting, the amount of the holdings is allocated on a pro rate basis between those below and those above the threshold.

The total investment amount of all the insignificant entity is checked against the set limit of 10% of CET1 amount of the parent bank amount post regulatory adjustments. The amount above 10% limit is processed for deduction. 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 trading book and banking book rule for the instrument belonging to trading book and banking book respectively.

The amount of investment that goes for deduction (that is, above 10% of the Parent Bank's CET1) is partly deducted from CET1 and rest is risk-weighted at 100% as per the time-lines.

The total investment amount of all the insignificant entity is checked against the set limit of 10% of CET1 amount of the parent bank amount post regulatory adjustments. The amount above 10% limit is processed for deduction. 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 trading book and banking book rule for the instrument belonging to trading book and banking book respectively.

The application computes as follows:

Entities are marked as insignificant investment entities by updating the flag: **F\_SIGNIFICANT\_INVESTMENT\_IND** in Fact Entity Information (**FCT\_ENTITY\_INFO**) with value N.

The exposure amount of banking book and trading book 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. Tier wise deduction percentage is calculated and this percentage is multiplied with the exposure amount to arrive at the amount to be deducted from each tier of capital.

The total investment values are populated into **BASEL\_III\_INSIGNFCNT\_INVST\_IN\_NON\_REG\_CONSL\_ENTITY\_DATA\_POP** which is the processing table for insignificant and significant investment deductions, by summing up the Pre Mitigation EAD amount in the Non Sec Exposures (**FCT\_NON\_SEC\_EXPOSURES**) table.

The sub process – **Insignificant Investment in entities outside Regulatory Consolidation Processing** in **BASELIII\_CAPITAL\_STRUCTURE** process covers the above processing.

- **Significant Investment Treatment for accounting entity where parent bank holding is more than 10% if issues common shares:**

The total investment amount of all significant investment entity is checked against the set limit of 10% of CET1 amount of parent bank post insignificant investment amount adjustment. The CET1 amount greater than 10% is deducted from the CET1 post insignificant investment amount deduction. The CET1 amount lower than 10% will get risk weighted at 250%. 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 – 'SIGNIFCNT\_INVST\_DED\_STD\_ACCT\_HEAD\_DATA\_POP' in Fact Entity Information (**FCT\_ENTITY\_INFO**) with value 'Y'.

The exposure amount of banking book and trading book exposures to these entities are summed up 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. The deduction percentage for CET1 is calculated and this percentage is multiplied 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 Regulatory Consolidation Processing**' in **BASELIII\_CAPITAL\_STRUCTURE** process covers the above processing.

#### **Phase-in arrangement:**

The regulatory adjustment line items that include goodwill, DTA, cash flow hedge reserves, gain on sale related to sec transaction, defined pension fund, cumulative gain and losses due to changes in own credit risk, treasury stock, and reciprocal cross-holdings, follows phase-in arrangement as per the timelines defined in the RBI III accord. Similarly, insignificant investment, significant investment, and threshold deduction amount line items will also follow phase-in arrangement, after insignificant, significant, and threshold treatment calculation. The phase-in deduction percent for each year is available in a setup table - **FSI\_SETUP\_CAPITAL\_HEAD**.

V_STD_ACCT_HEAD_DES C	N_CAPITAL_CO M P O N E N T _ V A L U E	D_START_DATE	D_END_DATE	V_CAPITAL_ADEQUACY_RE G U L A T O R
Phase-in Regulatory Deduction	0.20	4/1/2014	3/31/2014	RBI

The entire processing is done in sub processes – **Provisions and Gross Capital Calculations** and **Post Phase In Treatment calculations** in process – **IND\_BASELIII\_CAPITAL\_STRUCTURE**.

As per RBI, if bank follows the accounting practice where banks are not permitted to recognize the gain-on-sale in the P&L account including cash profits then, there is no need for any deduction on account of gain-on-sale on securitization. However, if a bank follows an accounting practice which in substance results in recognition of realized or unrealized gains at the inception of the securitization transactions then, those gains need to deduct from CET-1.

While in other jurisdiction banks recognized gain on sale in the P&L and deduct from CET-1.

- **Bifurcation of Insignificant and Significant Investment amount:**

All the investment transactions in insignificant entity and significant entity are bifurcated. Insignificant investment amount lower than 10% is stamped as “INSIG\_RWA”. Any amount above 10% is stamped as “INSIG\_DED”. The same logic is applied to significant investment amount in CET1. The CET1 amount in significant investment entity less than the 10% limit is stamped as “SIG\_RWA” and the amounts more than 10% is stamped as “SIG\_DED”. The original transactions are deleted and new transactions are created with the stamping process. The new transaction, thus created, can be traced back, by considering the parent exposure id.

The exposure to be deducted is marked with standard account head surrogate key based on whether the deduction is insignificant or significant investment and based on capital component group.

This splitting of exposures is done in Fact Non Sec Exposures (**FCT\_NON\_SEC\_EXPOSURES**) and Market Risk Exposures (**FCT\_MARKET\_RISK\_EXPOSURES**). This splitting logic is carried to Equity Exposures (**FCT\_EQUITY\_EXPOSURES**) and Fact Sub Exposures (**FCT\_SUB\_EXPOSURES**) as well.

The following sub processes in the process – **IND\_BASELIII\_CAPITAL\_STRUCTURE** are involved in this processing:

Non Sec Insignificant Investment Exposure Processing

Market Risk Insignificant Investment Exposure Processing

Non Sec Significant Investment Exposure Processing

Market Risk Significant Investment Exposure Processing

Non Regulatory Investment Sub Exposures Population

Equity Non Regulatory Investment Processing

- **Net Capital Calculation:**

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.

- **RWA Calculation for Credit Risk, Market Risk, Operational Risk and Phase –in arrangement:** The RWA amount for Non Securitization, Securitization, Market Risk, Operational Risk and Regulatory Adjustments Phase-In arrangement for Capital Instrument are calculated by summing up the RWA amount and is reported under different headings such as ‘Risk Weighted Asset amount for Standardized Portfolios/IRB portfolio’ for Non Securitization, “Sec Std RWA” for Securitization portfolio, “Market Risk RWA” for Market Risk, “Operational RWA” for Operational Risk and “Regulatory Adjustments Phase-In RWA” for Phase-In Arrangement. 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.

The above processing is done in sub process – **RWA Populations** in process – **IND\_BASELIII\_CAPITAL\_STRUCTURE\_CAPITAL\_RATIO**.

- **Admissible capital**

- For the purpose of reporting Tier 1 capital and CRAR, any excess Additional Tier 1 (AT1) capital and Tier 2 (T2) capital will be recognized in the same proportion as that applicable towards minimum capital requirements. This means that, to admit any excess AT1 and T2 capital, the bank should have excess CET1 over and above minimum requirement
- Admissible AT1 Capital is computed based on Available AT1 Capital and Available CET1 Capital, that is, Admissible AT1 Capital is computed as the summation of Minimum AT1 capital required and the excess available AT1 capital in the same proportion that Available CET1 capital is over the minimum required CET1 capital.
- Excess AT1 Capital not considered as AT1 capital is reckoned as Tier 2 Capital
- Admissible Tier 2 Capital is computed based on Available Tier 2 Capital and Available CET1 Capital. That is, Admissible AT2 Capital is computed as the summation of Minimum AT2 capital required and the excess available AT2 capital in the same proportion that Available CET1 capital is over the minimum required CET1 capital.

- **Capital Ratio Calculation:**

CET1 ratio, T1 ratio, T2 ratio, and Capital Adequacy ratio are calculated using the Total RWA amount and Net CET1 capital, Net T1 capital, and admissible T2 capital, and Total Capital (sum of Net T1 capital amount and Admissible T2 capital amount) amount.

This is done in sub process – **Capital Ratio Calculations** in process – ‘IND\_BASELIII\_CAPITAL\_STRUCTURE\_CAPITAL\_RATIO’.

- **Capital Buffers**

**Capital Conservation Buffer (CCB)**

RBI Basel III requires banks to maintain Capital conservation buffer outside periods of stress that can be drawn down as losses are incurred. This buffer is required to be maintained over and above the minimum capital requirements. It needs to be calculated as a percentage of risk weighted assets out of Common Equity Tier 1 Capital (CET1).

RBI Basel III has not prescribed any requirements related to Countercyclical Buffer and any Addition Loss Absorbency buffer (G SIB/D SIB). Hence the same are not included as part of the solution.

In cases where Common Equity Tier 1 Ratio falls below certain levels during periods of stress/loss, RBI Basel III imposes constraints on making discretionary payments (dividends, share buybacks and bonus), so that banks can replenish their CET1 ratio. In case the bank does not want to restrict its discretionary payments, it can alternatively raise capital from private sector, with prior approval of regulator.

This requirement is as per the transitional arrangement as stated in the RBI Basel III guidelines.

RBI recommends a Required Capital Conservation Buffer of 2.5% of risk weighted assets by 2019. The implementation has been phased out over a period of four years in a uniform manner of 0.625% increment each year, starting from Mar 31<sup>st</sup> 2016 to March 31<sup>st</sup> 2019 (as given in RBI document).

**Transition by:**

<b>Effective Date</b>	<b>Benchmark Values</b>
31-Mar-2016	0.625%
31-Mar-2017	1.250%
31-Mar-2018	1.875%
31-Mar-2019	2.500%

**Calculation of Capital Conservation Buffer / Available Buffer from CET1 Capital**

The value that the Basel Regulatory Capital application calculates for Available Buffer from CET1 Capital meets the buffer requirements for all three buffers - Capital Conservation Buffer (CCB), Countercyclical Buffer, and Additional Loss Absorbency Capital Requirement. No priority is given to any buffer over another. Hence, the shortfall or excess (if any) is calculated and reported at an aggregate level. The required total buffer is calculated as the sum of the required values of three individual buffers.

This buffer is calculated as excess of CET1 Capital over 5.5% (CET1 here is inclusive of 5.5% benchmark CET1 ratio requirement, but excluding additional CET1 needed to maintain 7% Tier 1 Capital Ratio and 9% Total Capital Ratio).

For Example: A bank with 7% CET1, 7% T1 and 9% Total Capital (that is, no Additional Tier 1 or Tier 2 capital) would not have any excess CET1 capital and hence would have capital conservation buffer of 0%. CCR is solely dependent on CET1 Ratio only.

The application also computes CET1 and Buffer Lookup Ratio, which is further required for calculating Minimum Capital Conservation Ratio. To calculate this buffer, remainder of following is taken:

- Excess of CET1 Capital Ratio over the benchmark (5.5% after catering to the shortfall (if any), in the Additional Tier 1 and Tier 2 Capital to their respective benchmark levels (1.5% and 2% respectively).

Hence, CCB excludes any additional CET1 needed to maintain 7% of Tier 1 Capital Ratio and 9% of Total Capital Ratio.

The required buffer from CET1 Capital is compared with Available Buffer from CET1 Capital. If the banks are unable to meet their total buffer requirements, then they are subject to constraints on the discretionary payments of earnings. In this case the Capital Conservation Ratio is calculated and represents the percentage of net earnings after tax (positive) not distributed by the bank and held back as retained earnings. Capital Conservation Ratio of the current year is applied after 12 months from the time of calculation. This is ascertained by the minimum Capital Conservation Ratio range for a given CET1 and Buffer Lookup Ratio in a table. This table is dynamic and formula driven and is constructed by the application using the values of the required buffer as per the RBI Basel III guidelines. The application constructs the range of CET1 and Buffer Look-up ratio (Lower Limit and Upper Limit) for the required Capital Conservation Ratio in four quartiles.

This is arrived by looking at the minimum capital conservation ratio for a given (Benchmark + Buffer) range in the below table when the buffers come in fully at the end of transition period:

Minimum capital conservation standards for individual bank		
Common Equity Tier 1 Ratio after including the current periods retained earnings		Minimum Capital Conservation Ratios (expressed as a percentage of earnings)
Lower Limit	Upper Limit	
5.5%	6.125%	100 %
Above 6.125%	6.75%	80 %
Above 6.75%	7.375%	60%
Above 7.375%	8.0%	40%
Above 8.0%		0%

**Lower Limit = 0.000001 + Upper Limit of (n-1)<sup>th</sup> quartile**

**Lower Limit of first quartile =- 0.045**

**Upper Limit = 0.045 + (Total Required Buffer from CET1 Capital \* 0.25 \* n)**

Where n is the quartile number

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**NOTE:** The application calculates Capital Buffers at consolidated level for the reporting bank. However, at the discretion of national supervisors, this can be applied at solo level as well. In such cases, the calculation of solo level for the respective jurisdictions has been included in the application.

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### ***Assumptions***

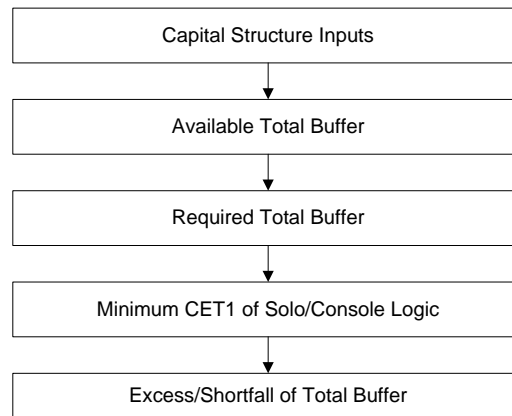
In Capital Conservation Ratio for the computation of the quartiles that are used to arrive at Minimum Capital Conservation Ratio, the application is dependent on the required CCB ratio. From 2013 till 2016, CCB requirements will keep changing every year as per the transitional arrangement, For the purpose 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 5.5%

### ***Key Data Elements***

As the required Capital Conservation Buffer (CCB) needs to be met as per the transitional arrangement, the required buffer value needs to be setup in Setup Capital Heads (**FSI\_SETUP\_CAPITAL\_HEAD**) 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 needs to be the same as the jurisdiction code assigned by the Rule **Jurisdiction Code Assignment**.

The minimum Capital Conservation Ratios requirement for different quartiles specified by different regulators 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.



**Process Flow**

The tasks related to capital buffer calculations are present in the process named **CAPITAL\_BUFFER**. The processing is as following:

- **Capital Structure Inputs**

The Capital Structure Rules are executed before the calculation of buffers. These Rules calculate the available capital ratios and required capital ratios of the three capital components which are Common Equity Tier 1 Capital ratio, Tier 1 Capital Ratio, and Capital Ratio.

These line items are populated in the **Fact Standard Accounting Head** table.

- **Available Total Buffer:** Calculation of Available Buffer from CET1 Capital is performed using inputs taken from Capital Structure Inputs.

- **Required Total Buffer:**

Calculation of Required Capital Conservation Buffer - Required Total Buffer for RBI is currently only the requirements related to Capital Conservation buffer.

Calculation of Required Buffer from CET1 Capital, Tier1 and Capital Adequacy Ratio: For the calculation of these required buffers, based on **n\_upd\_cap\_comp\_group\_skey** (which corresponds to BFCET1 - Buffers from CET1 for Required Buffer from CET1 Capital, BFT1 - Buffers from T1 for Required Buffer from T1 Capital and BFCAR - Buffers from CAR for Required Capital Adequacy Ratio), the standard account head amount is summed up and populated against the corresponding cap id in **Fact Standard Accounting Head** table.

- **Minimum CET1 of Solo/Console Logic:**

As per RBI guidelines, for a Parent Bank, in case of Solo and Consolidation runs banks to pick lowest CET1 value among solo & consolidated run for CCR related to minimum CET1 value, that is, max of CCR value.

For example:

Solo CET1	Consolidated CET1	CET1 Ratio (Upper and Lower) Refer Table 2	Limit	Minimum Capital Conservation Ratios
6.8%	7.4%	6.75% - 7.375%		60%
6.6%	6%	5.5% - 6.125		100%

For example, if a bank's Common Equity Tier 1 ratio at solo level is 6.8% and that at consolidated level is 7.4%. It will be subject to a capital conservation requirement of 60% consistent with the Common Equity Tier 1 range of >6.75% - 7.375.

Suppose, a bank's Common Equity Tier 1 ratio at solo level is 6.6% and that at consolidated level is 6%. It will be subject to a capital conservation requirement of 100% consistent with the Common Equity Tier 1 range of >5.5% - 6.125% on minimum capital conservation standards for individual bank.

- **Excess/Shortfall of Total Buffer:**

The calculated values (only positive values are considered) are stored against the corresponding Cap IDs as two separate line items of which one will be 0.

## 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 refer to the Download Specifications document.

- Entity details which are part of regulatory consolidation and parent entity share holding percent. This data is captured in Stage Entity Shareholding Details (**ENTITY\_SHR\_HLD\_PERCENT\_POP**) table.
- The capital structure component for each tier of capital for all entities involved in regulatory consolidation.
- The capital investments recognized as eligible under Basel II structure are captured in stage issued instrument positions (**ISSUED\_INSTR\_POSITIONS\_DATA\_POPULATION**) for capital instruments which are already expired, no data is expected both at GL level and in Stage Issued Instruments positions. This includes instruments where a call option was available and the same got exercised.
- 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 are 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**).

## **Leverage Ratio**

### ***Overview***

As part of Basel III guidelines issued by RBI in July 2013, Banks are expected to comply with Leverage ratio in addition to capital ratios. This measure will help keeping in control the total balance sheet exposure ratio to Banks capital and mainly helps in containing on balance sheet and off balance sheet leverage buildup. The minimum required leverage ratio is 4.5%.

The leverage ratio shall be maintained on a quarterly basis. The basis of calculation at the end of each quarter is “the average of the month-end leverage ratio over the quarter based on the definitions of capital (the capital measure) and total exposure (the exposure measure).

Regulatory leverage ratio is calculated as an arithmetic mean of the monthly leverage ratio over a quarter. Monthly Leverage Ratio is calculated at the end of the month. The leverage ratio is calculated by dividing an institution’s capital measure by the total exposure.

$$\text{Leverage Ratio} = \text{Capital Measure} / \text{Exposure Measure}$$

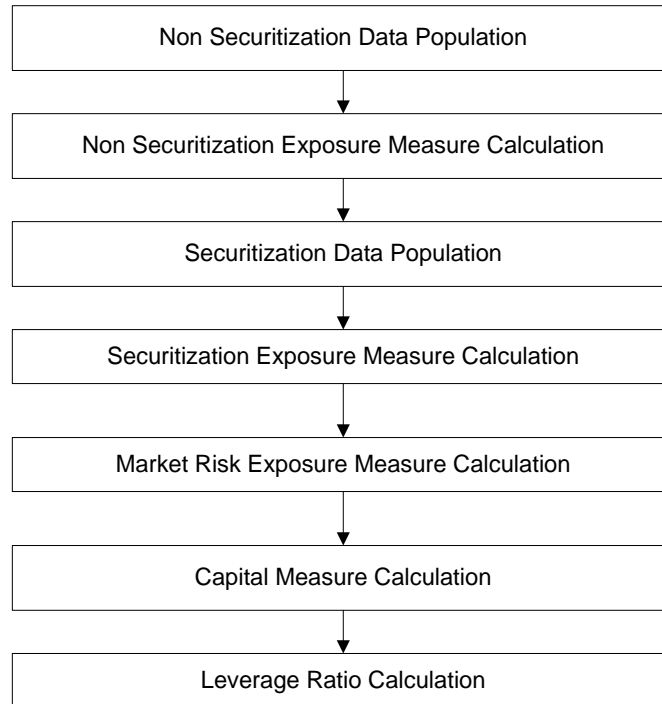
Capital Measure is calculated as Net Tier 1 Capital which is the summation of Net CET1 and Net AT1 Capital amount post regulatory adjustment.

Exposure Measure is the summation of on-balance sheet items, off-balance sheet items, Over the Counter (OTC), Structured Financial Transactions (SFT), securitization, and all market related instrument’s transaction amounts. Mitigation amount is not considered while calculating exposure amount.

Additionally, the investments in the capital of the entities, where a financial entity is included in the accounting consolidation but not in the regulatory consolidation, are deducted to the extent that they exceed 10% of the bank’s common equity. Also, the assets of such entities included in the accounting consolidation are excluded from the exposure measure.

**NOTE:** While executing a solo Run, the parent entity’s exposure amount related to on-balance sheet items, off-balance sheet items, OTC, SFT, securitization, and market related instruments are considered. The total consolidated asset of the significant entity is not calculated in exposure measure while executing a solo Run. Executing a consolidated Run requires subsidiary data and total consolidated assets of significant investment entity.

### ***Process Flow***



A prerequisite for leverage ratio processing is Staging Market Risk Data Population. Market risk exposure is aggregated from the outstanding positions of the instruments. Hence, population of market risk positions is a pre-requisite for the exposure measure calculation of market risk.

Leverage ratio is calculated by executing the Run **Basel III Leverage Ratio Calculation**. This Run contains the following processes

- IND\_BASELIII\_CAPITAL\_CONSOLIDATION
- IND\_BASELIII\_PARTY\_RECLASSIFICATION
- PARTY\_SHAREHOLDING\_PERCENT
- IND\_BASELIII\_PRODUCT\_TYPE\_RECLASSIFICATION\_STD
- IND\_BASELIII\_NON\_SEC\_EXPOSURE\_MEASURE\_CALCULATION
- SEC\_DATA\_POPULATION
- IND\_BASELIII\_CAPITAL\_STRUCTURE\_INDIAN\_BANKS
- LEVERAGE\_RATIO

The process flow for calculation of leverage ratio is as follows:

- **Non Securitization Exposure Data Population:** Data from the Product Processors are populated to **non sec processing** table in the process NON\_SEC\_DATA\_POPULATION. Non Sec Exposure Measure used in the Leverage ratio is the summation of the following products:
  - On-Balance Sheet Item
  - Repo-Style Transaction
  - Derivative Transaction
  - Off-Balance Sheet Item

Details on the calculation of these exposure measures are mentioned in the following section.

- **Non Securitization Exposure Measure Calculation:** After data is populated in non sec processing table, the exposure measure is calculated in the process IND Basel III Non Sec exposure measure calculation. As the CCF value, (which is further used in exposure measure calculations) for off-balance sheet items are different for leverage ratio calculation and capital calculation, leverage ratio cannot be calculated as part of the Capital Calculation Run.

Details on the calculation of non sec exposure measures are as follows:

**On Balance Sheet Items** – The accounting value of the on-balance sheet items is considered. The on-balance sheet item is the net of specific provisions and valuation adjustments. The following items are not considered while calculating the exposure measure for on-balance sheet item thereby reducing the exposure amount:

- Physical or financial collateral
- Guarantee or credit risk mitigants elements
- Netting of Loans and deposits.

The exposure amount for on-balance sheet items is a download amount and is available as an input data. Nettable transaction related to OTC, SFT, internal transactions (like inter group transaction), treasury stock and reciprocal cross-holding is not a part of on-balance sheet transactions.

The calculation of exposure measure for the leverage ratio generally follows the accounting measure of exposure, except netting in the following scenarios:

- SFT exposure is calculated without netting various long and short positions with the same counterparty. As per RBI guidelines, the long and short positions of a same counter party should not be netted off for Leverage ratio
- Derivatives exposure is calculated without netting the MTM values and PFEs in respect of various long and short positions with the same counterparty.

**Off-balance sheet items** – All the off-balance sheet items listed below are converted into credit exposure equivalent through CCF assignment:

- Commitments (including liquidity facilities)
- Unconditionally cancellable commitments
- Direct credit substitutes
- Acceptances
- Standby letters of credit
- Trade letters of credit
- Failed transactions and unsettled securities

100% CCF is uniformly assigned. However, any commitment that is unconditionally cancellable at any time by the bank without prior notice, a CCF of 10% is applied. The exposure amount for off-balance sheet items is obtained after multiplying the undrawn amount with the CCF percent and the exposure amount.

- **Securitization Data Population:** Securitization exposure data is populated to securitization processing table in the process SEC\_DATA\_POPULATION.
- **Securitization Exposure Measure Calculation:** After securitization exposure data is populated, exposure measure is calculated in the process IND Basel III SEC\_EXPOSURE\_MEASURE\_CALCULATION. A sub process 'IND Sec CCF Assignment – Leverage ratio' is created and the below two rules are added:

- Sec CCF Assignment for Eligible Liquidity Facility - STD
- IND Basel III Sec CCF Assignment for Off Balance Sheet Exposures - STD

To the sub process “IND Basel III Sec EAD Computation – Leverage ratio”, add the rule ‘IND Basel III Sec Pre-Mitigation EAD Amount – STD’.

Securitization transactions follow the accounting measure of exposure. The exposure amount of both the originator and investor are considered to arrive at the exposure amount. The securitization transaction where CCF assignment is applicable is assigned as prescribed in the Basel II guidelines.

- **Market Risk Exposure Measure Calculation:** Market risk data that is populated through Staging MR data population Run, is populated in the market risk processing table and the exposure measure is calculated in the process MKT\_RISK\_EXPOSURE\_MEASURE\_CALCULATION. The following market related instruments are considered for exposure measure. The total exposure measure used in the leverage ratio is the sum of the exposure amount for all products:

- Interest rate
- Equity
- Forex
- Commodity
- Options

Netting of long and short position is done at instrument level. The post netting value is considered as exposure measure. While calculating exposure amount for subsidiaries that are part of regulatory consolidation and used in the leverage ratio, the exposure amount is limited to the share-holding percentage. For example: A subsidiary which is part of regulatory consolidation and parent holding in the subsidiary is 45%, only exposure amount limited to 45% is considered for exposure measure calculation. Similarly, if the holding is more than 50%, the entire amount is considered for exposure measure calculation.

- **Capital Measure Calculation:** Capital measure is calculated in BASELIII\_CAPITAL\_STRUCTURE process. Capital Measure used in the leverage ratio is equal to Net Tier 1 and is calculated as follows:

**Net Tier 1 capital = CET1 Capital + AT1 Capital – Regulatory Adjustment to CET1 – Regulatory Adjustment to AT1**

- **Leverage Ratio Calculation:** The calculation of leverage ratio is detailed as follows:

**Current Month Leverage Ratio:** The application uses the Total Exposure Measure amount and Net Tier 1 Capital to calculate the current month leverage ratio by dividing the Net Tier1 capital by Total Exposure Measure amount. The amount is stored under the standard account description as “Leverage Ratio” and STANDARD\_ACCOUNTING\_HEAD ID CAP843.

**Regulatory Leverage Ratio:** The regulatory leverage ratio is the mean of three month leverage ratio using the current month leverage ratio and previous two months’ leverage ratio which is a download value. The regulatory leverage ratio is stored against the standard accounting ID CAP842. Leverage and the regulatory leverage ratio is calculated in the process **LEVERAGE\_RATIO**.

To calculate the regulatory leverage ratio the application requires the previous two current month leverage ratio. The client or the bank should provide the previous two month leverage ratio value as a download in STG\_STANDARD\_ACCOUNTING\_HEAD against the standard accounting head ID CAP844 and CAP845 corresponding to previous month leverage ratio and second previous month leverage ratio.

If the leverage ratio Run batch is executed separately for the past two months, then these values are populated back to staging table for **non-accounting data** table for the current execution date. The

Run Basel III Staging Data Creation - Previous Month Leverage Ratio is created with the T2Ts LEVERAGE\_RATIO\_PREVIOUS\_MONTH\_DATA\_POPULATION and LEVERAGE\_RATIO\_SECOND\_PREVIOUS\_MONTH\_DATA\_POPULATION. You need to change the Run key of the Runs corresponding to previous two months' leverage ratio calculation Run, before executing this Run. This Run needs to be executed prior to executing the leverage ratio calculation Run.

### ***Key Data Elements***

The a few key data elements have been elaborated in this section. For a complete list of tables and columns to be populated refer to the Download Specifications document.

To calculate the leverage ratio, exposure amount for all product types are required as well as total consolidated asset for significant investment entity is required to calculate exposure measure. The key data elements for exposure measure calculation of the various product types are as follows:

- On-Balance Sheet Item: For on-balance sheet items, End of Period (EOP) balance amount, write-off, and accrued interest amount is required.
- Repo-Style Transaction: For repo products, exposure amount, and instrument rating are required.
- Derivative Transaction: For derivative products, exposure mark to market value, notional principle amount, and underlying instrument types are required.
- Off-Balance Sheet Item: For off-balance sheet items, undrawn amount is required.
- Securitization Transaction: For securitization transactions, exposure amount is required.
- Market risk related instrument: For market risk instruments, the unit price as well as the number of units are required.
- Total consolidated asset of the significant investment entity: The total consolidated asset value of the significant investment entity is required.

## **4.2.3 Changes in US Regulatory Capital Rules - Standardized Approach**

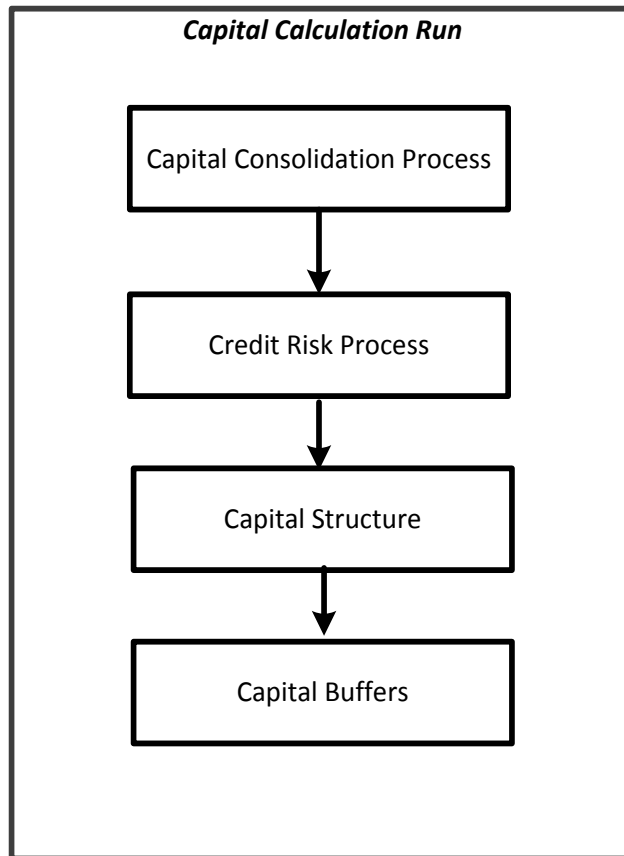
### **High Level Process Flow**

The application supports capital computations for Credit Risk along with Capital Structure, Capital Buffers, and Capital Consolidation process as per US Regulatory Capital Rules for Implementation of Basel III in US as finalized by the agencies.

For more information on the pre-defined Runs available with the application, refer *OFS Basel Regulatory Capital Run Charts*.

The sequence wise flow of processes included in the application is as follows:

## Process Flow for Capital Adequacy Ratio calculation



### Capital Calculation Run

The Capital Calculation Run depicted in the preceding process flow, is a single run which is joined together by multiple processes. Each process is a block, compiled together to form an entire Capital Adequacy run. The individual blocks like the Credit Risk process exists as individual run which is described in the following sections.

#### *Capital Consolidation Level Selection*

The reporting bank may be a part of a financial group that has multiple legal entities like parent or child entities (subsidiaries) under its name. The entity on which you are required to process should be selected by you. Subsequently, the level at which a Run is to be executed (solo or consolidated) should also be selected. You can select these options in the [Run Management](#) UI. However, if the Run is executed in the Run Rule Framework (RRF), then these options have to be set using the Rule '**Capital Consolidation Level Selection**' in the process '**CAPITAL\_CONSOLIDATION**'.

**CAPITAL\_CONSOLIDATION** is the first process to be added in all the Runs defined in the RRF except for the Staging Data Population Run. The Run Management UI selects this process by default.

#### *Run Parameters Assignment*

The US Regulations states different approaches for calculating RWA. The Run Management UI in the application allows the reporting bank to define and execute a Run by selecting a combination of different approaches for RWA computation.

Run Parameter Assignment is also a part of **Capital Consolidation** process. The Rule '**Run Definition User**



**Defined Run Param Assignment** is used to assign the Run parameters if a Run is executed in the RRF. If the Run is executed from the Run Management UI, then the parameters are populated based on the Run defined in the [Run Definition](#) window.

### ***Currency Conversion***

The exposure amount and other general ledger amount data attributes that are provided as input (in stage tables) are in the natural currency (exposure currency) and this is usually different for exposures across different countries. The application converts them to reporting currency columns so that processing for all exposures happens in one single currency. The rules which do the currency conversion from natural currency into reporting currency are based on the exchange rate provided.

### ***Reclassification***

The application reclassifies the bank's product types and party types to Basel standard product and party types. Based on standard Basel product and party type, it forms an asset class for each exposure. Equity is reclassified by the application in a separate Rule. Similarly, the application does reclassification for mitigant on the basis of its mitigant types and reclassifies it to standard mitigant types.

#### Product Type Reclassification

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

#### Party Type Reclassification

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

#### Asset Class Reclassification

On the basis of Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing.

For example:

When standard counterparty is a large corporate, the asset class is large corporate, except when exposure has product types like cash and real estate.

For Basel product type gold, the asset class is gold, however when standard counterparty type is Central Counter Party, the asset class is Central Counter Party.

For standard counterparty type Corporate Non SME and Basel product type as Loan, the asset class is Corporate Non SME.

Asset class for all equity products is reclassified on the basis of equity type and Basel product type.

#### Mitigant Reclassification

For mitigants the application reclassifies the mitigant type to the standard mitigant type like the debt securities, credit derivative, cash, and so on. It also reclassifies the mitigant issuer type to the standard mitigant issuer type like Banks, Corporate, and so on. The reclassification tasks are present in the **Mitigant Reclassification** sub process.

The following file has details of asset re-classification, product type reclassification, and party type reclassification for Non Sec only. z

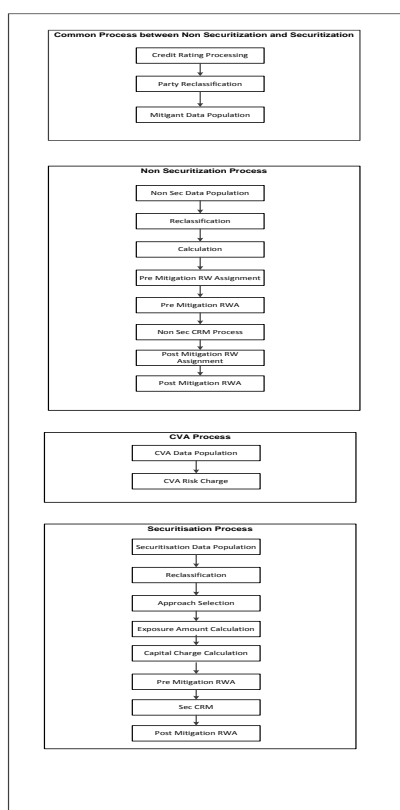


US III  
Reclassification Rule.:

### Shareholding Percent Multiplication

For all entities in Capital Consolidation, the application updates the shareholding percentage against each entity data in fact capital accounting head table from fact entity share holding percent table. The parent data in fact capital accounting head will be updated with 1 as value and for each child entity the data will be based on the parent's holding percentage specified for each child in the fact entity share holding percent table.

### Process Flow for Credit RWA



Credit RWA Run is a combination of Non securitization RWA, Credit Valuation Adjustment (CVA) RWA, and Securitization RWA. For Credit Risk for Non Securitized exposures and Securitization positions, the application follows the Standardized Approach.

CVA calculation has two approaches, the Standardized Approach and Advanced Approach, which is detailed separately under [Credit Valuation Adjustment](#) section under Credit RWA.

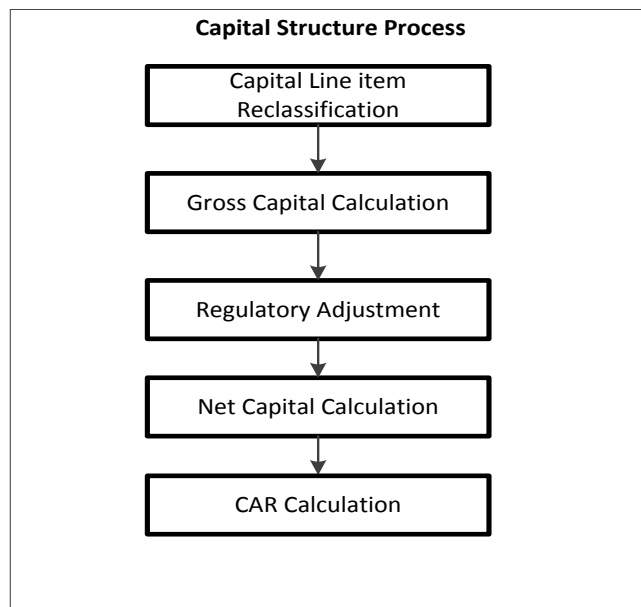
A few processes like Credit Rating, Party Type Reclassification, and Mitigant data population are common between Non Securitization, CVA, and Securitization process. These are executed only once under the Credit RWA Run even though these sub processes are explained separately under Non Securitization, CVA, and Securitization section of this document.

Certain sub processes under the Non Securitization process, like Reclassification, are common across Non Securitization exposures for over the counter derivative transactions and securities financing transactions. These 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 Non Securitization section of the user guide.

For more information on these sub processes, refer to *Credit RWA*.

Risk Weight assignment method, which is a part of Pre-Mitigation Capital Charge, is explained in the 'Pre-Mitigation Capital Charge' section under Non Securitization exposures. Credit Risk Mitigation for Securitization and Non Securitization is handled in two separate sub processes. For more details refer Risk Weight Assignment sections in the user guide.

## Process Flow for Capital Structure

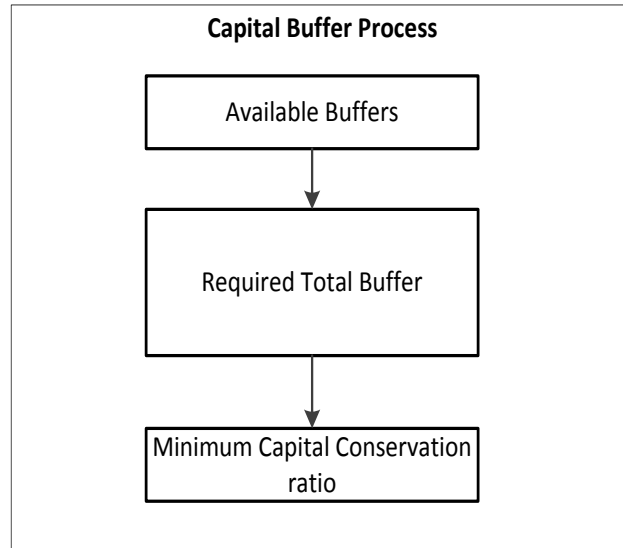


Capital Structure is executed along with Capital Consolidation and Credit RWA process. Each sub process mentioned in the preceding flow chart has a detailed explanation present in the Capital Structure section of this document.

For example: 'Gross Capital Calculation' mentioned in the preceding flow chart is explained in detail under 'Gross Capital Calculation' sub process section of the Capital Structure. Likewise 'Regulatory Adjustment' and 'Net Capital Calculation' is detailed under 'Regulatory Adjustment' and 'Net Capital Calculation' sub process section of Capital Structure.

For more information, refer to *Capital Structure*.

## Process Flow for Capital Buffer



Capital Buffer is calculated post capital ratios are calculated, as they go as an input to Buffer calculation. Each sub-process is explained in detail under Capital Buffer section of this document.

For example, required total buffer and capital conservation buffer calculation are detailed of this document. For more information, refer to *Capital Buffers*.

## Implementation Approach

1. During implementation of US STD rules, only the following rules needs to be re-configured.

<b>Rule to be re-configured</b>	<b>Remarks</b>
Basel III Capital Consolidation Approach Type Reclassification for an Entity	
Capital Consolidation Level Selection	
Credit Rating Reclassification	This rule needs to be re-configured only if the institution is using external ratings for determining the credit quality of the counterparty
Sec Basel II Bank Role Reclassification	
Standard Mitigant Type Reclassification - STD	
USA - Equity Product Type Reclassification	
USA - Non Sec HVCRE Product Type Reclassification	
USA - US III - Capital - Standard Acct Head Reclassification	
USA - US III - CS - Capital Component Group Mapping	This rule needs to be re-configured only if the institution has standard accounting heads apart from out-of-box standard accounting heads to be categorized into the respective capital component tier.
USA - US III - Equity Investment Fund Approach Selection	
USA - US III - Non Sec Standard Product type to Capital Comp Group Reclassification	This rule needs to be re-configured only if the institution has additional product types apart from out-of-box product types to be categorized into the respective capital component tier.
USA - US III - Sec Basel Product Type Reclassification	
USA - US III Party Type Reclassification - STD	
USA -US III Product Type Reclassification - STD	
USA Sec Basel II Pool Type Reclassification	

2. The institution needs to source the data for the following hierarchies only. Others are pre-configured in the out-of-box product.

Hierarchy name
Bank Base Role
Bank Cap Consl Approach
Capital Accounting Head
Counterparty Type
Mitigant Type
Organisation Structure
Product
Rating
Securitisation Pool Type

- Run management screen should be used to define runs required considering the portfolio that the institution has and the methodology that the institution wants to opt wherever there is a choice.

## Credit RWA

The application supports the computation of Credit RWA as per the guidelines laid out in the US Regulatory Capital Rules. Credit RWA computation is broken down into Credit Risk for Non Securitized Exposures and Credit Risk for Securitized Exposures. For Credit Risk for Non Securitized Exposures, the application follows the Standardized Approach, Foundation Advanced Approach for US, and Advanced Approach for US. Credit RWA computation also consists of computation of Credit Valuation Adjustments that follows Advanced as well as the Standardized Approach which is explained in later section.

## Non Securitization: Standardized Approach

All the credit risk exposures are identified by their product types, counterparty types, and their corresponding asset classes. A sample list of products types, party types, mitigant types, and credit ratings are pre-defined in the Basel application. However, this list and naming convention differs from one bank to another. Hence, the application reclassifies the bank's data into standard data as per the US Regulatory Capital Rules. The application reclassifies the bank's product types and party types to Basel standard product and party types.

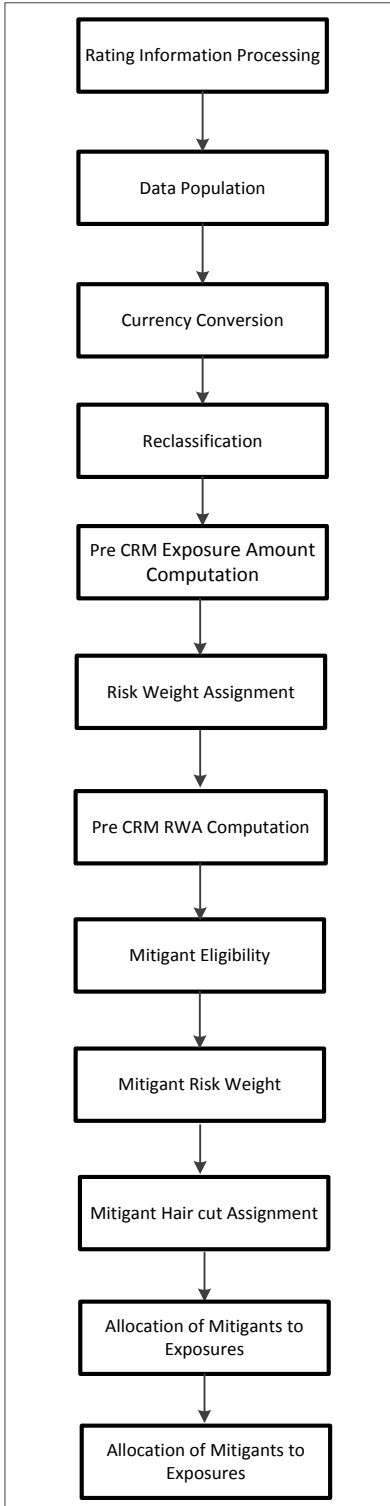
Based on these standard Basel product types and party types, an asset class for each exposure is formed. It also checks for conditions regarding regulatory retail portfolio asset class. For details refer Asset Class Reclassification section under [Risk Weighted Assets Calculation](#). For equity exposures, the asset class is formed on the basis of equity type and Basel product type. A further data processing is done based on these standard reclassifications.

Some exposures may be hedged against Credit Risk through various mitigants like guarantors, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and should be considered while computing Credit RWA as per US Regulatory Capital Rules. Hence, the application calculates both pre-mitigation exposure amount and post-mitigation exposure amount.

The Basel committee has revised Credit Risk Mitigation (CRM) guidelines to a large extent and the same have been incorporated in the application. The changes at a macro level relate to the recognition of the eligible mitigants, applicable for both the Securitized as well as the Non-Securitized exposures. The US regulators have also revised the haircuts to be applied for the debt securities issued by a securitization transaction which act as collateral. The remaining processing for CRM remains the same as per the previous releases of the Basel application. Depending upon the asset class, the application calculates the pre-CRM exposure amount for each exposure. This value signifies the maximum loss that the bank can suffer in case of default on this exposure, prior to considering any mitigation effects. 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 (Pre-CRM RWA) and post mitigation risk weighted assets (Post CRM RWA) by multiplying the respective exposure amount by risk weight. The risk weight in this case is arrived at by analyzing the OECD Country Risk Classifications (CRCs) of the exposures or other such criteria as specified in the US Regulatory capital rules. Some Credit Risk exposures that fall under the category of internal transactions like holding own subsidiaries shares or investment in its capital, reciprocal cross holding, and so on, are treated separately under Capital Structure.



For processing of all the other line items for banking book products, securities financial transactions, and over the counter products, refer *Non Securitization- Standardized Approach*.



### **CCF Assignment**

As per the e US Regulatory Capital Final Rules for Standardized Approach following are the CCF assigned to off-balance sheet items:

1. **0% CCF** to the unused portion of a commitment that is unconditionally cancelable by the bank.
2. **20% CCF** to commitments with an original maturity of one year or less that are not unconditionally cancelable by the bank.
3. **20% CCF** to self-liquidating trade-related contingent items with an original maturity of one year or less.
4. **50% CCF** to commitments with an original maturity of more than one year that are not unconditionally cancelable by the bank.
5. **50% CCF** to transaction-related contingent items.
6. **100% CCF** to guarantees, repurchase agreements, credit-enhancing representation and warranties that are not securitization exposure, securities lending and borrowing transactions, financial standby letters of credit and forward agreements.

Also banking organizations must apply the lower of 20% or 50% CCFs to the exposures related to commitments to extend letters of credit. Banking organizations must make this determination based upon the individual characteristics of each letter of credit.

Equity commitments are assigned as conversion factor as follows:

1. Conditional equity commitments with an original maturity of one year or less receive a CF of 20%.
2. Conditional equity commitments with an original maturity of over one year receive a CF of 50%.
3. Unconditional equity commitments receive a CF of 100%.

<b>Basel II Product</b>	<b>Original Maturity</b>	<b>Non Sec Unconditionally Cancellable Facility</b>	<b>CCF Assignment (%)</b>
Loan Commitment	-	Yes	0
Loan Commitment	Less than equal to 1 year	No	20
Loan Commitment	More than 1 year	No	50
On Balance sheet	Less than equal to 1 year	-	20
On Balance sheet	More than 1 year	-	50
Off-Balance sheet	Less than equal to 1 year	-	20
Off-Balance sheet	More than 1 year	-	50
Short-term Self-liquidating Trade Contingencies	Less than equal to 1 year	-	20

The following is the mapping of CCF Assignment according to the Basel product.

<b>Basel II Product</b>	<b>Drawn CCF Assignment (%)</b>
Transaction-related Contingencies	50
Financial Standby Letter of Credit	100
Guarantee	100
Forward Agreements	100

Equity Commitments depending upon the conditional or unconditional flag are also assigned conversion factor values which are as follows:

<b>Basel II Product</b>	<b>Conditional Equity Commitments</b>	<b>Original Maturity</b>	<b>CF</b>
Equity Commitments	Y	Less than equal to 1 year	20%
Equity Commitments	Y	More than 1 year	50%
Equity Commitments	N	Higher level	100%

### **Credit-Enhancing Representations and Warranties**

The accord states that Credit-Enhancing Representations and Warranties does not include the following:

- a) Early default clause, covering, one-to-four family first-lien residential mortgage loans that qualify for a 50 percent risk weight for a period not to exceed 120 days from the date of transfer.
- b) Premium refund clauses covering, one-to-four family first-lien residential mortgage loans that qualify for a 50 percent risk weight for a period not to exceed 120 days from the date of transfer.
- c) Premium refund clauses that cover assets guaranteed by the U.S. government, a U.S. Government agency, or a GSE, provided the premium refund clauses are for a period not to exceed 120 days from the date of transfer.
- d) Warranties that permit the return of underlying exposures in instances of misrepresentation, fraud, or incomplete documentation.

If the Credit-Enhancing Representations and Warranties are fulfilling the above criteria, the capital need not be calculated and hence applied a risk weight of zero, for these exposure. If the above criteria is not met a CCF of 100% is assigned.

The mapping must be as follows:

Basel II Product	Early Default Clause	Transfer Days	RW
CER	Y	<=120	0
WARNTY	Y	<=120	0

Basel II Product	Premium Refund Clause	Transfer Days	RW
CER	Y	<=120	0
WARNTY	Y	<=120	0

If Credit-Enhancing Representations and Warranties do not follow any of the criteria as mentioned, CCF of 100% is assigned.

Basel II Product	Early Default Clause	Premium Refund Clause	Securitized Flag	Return of Underlying Exposure	CCF (%)
Credit Enhancement Facility	N	N	N	N	100
Warranties	N	N	N	N	100

The accord also states that warranties and Credit Enhancing representation that have a premium refund clause and the asset against which the warranties and Credit Enhancing representation have been provided are guaranteed by the U.S. government, a U.S. Government agency, or a GSE and original maturity of warranties is below 120 days and no capital is kept. Hence, zero risk weight is assigned.

Basel II Product type	Underlying Exposure Guaranteed by Sovereign/US/GSE	Premium Refund Clause	Transfer Day	RW
CRE	Y	Y	<=120	0
WARNTY	Y	Y	<=120	0

For Warranties that permit the return of underlying exposures in instances of misrepresentation, fraud, or incomplete documentation, the mapping is as follows:

Basel II Product Type	Return of Underlying Exposure	RW
WARNTY	Y	0

Exposure amount against Warranties that have premium refund clause should be equal to servicing premium and other earned fees. Exposure amount against Warranties that have return refund clause should be equal to full loan value. Both the exposure amount should be stored in column 'n\_exposure\_amount'.

### EAD Computation

EAD amount computation for on-balance sheet exposure, each OTC contract, off-balance sheet commitment exposure type is same as that of BIS Standardized Approach.

Exposure amount for AFS or held-to-maturity debt securities and AFS preferred stock not classified as equity that are held by a banking organization that has made an AOCI opt-out election, the exposure amount is the banking organization's carrying value (including net accrued but unpaid interest and fees) for the exposure, less any net unrealized gains, and plus any net unrealized losses.

Exposure amount for AFS preferred stock classified as an equity security under GAAP that is held by a banking organization that has made an AOCI opt-out election, the exposure amount is the banking organization's carrying value (including net accrued but unpaid interest and fees) for the exposure, less any net unrealized gains that are reflected in such carrying value but excluded from the banking organization's regulatory capital.

### Equity/ UCITS/Mutual Fund/ Equity Commitments EAD calculation

Equity /UCITS / Mutual Fund EAD amount =

Exposure carrying value – Exposure Unrealized Gain + Exposure Unrealized Gain Loss

Here,

Equity commitments EAD = Effective notional principal amount \* Conversion Factor

The equity derivative EAD calculation is same as defined in the USA Advanced run and the failed transaction EAD computation is same as defined in the USA Advance Approach.

## Risk Weight Assignment

Non Sec Risk Weight Assignment for Exposures on US Government, Supranational and MDB, GSE, Corporate, Statutory Multifamily Mortgages, HVCRE and Others.

Risk weight assignment is based on Basel Asset class which is formed based on Basel Standard Party Type and Standard Product Type. The following are the risk weight assignments for other asset types:

### Sovereign Exposures

Exposure to US Government - A rule termed as USA - US III - Non Sec RW Assignment based on asset class is created to assign risk weight based on Basel Asset class, this rule caters to risk weight assignment for multiple asset classes, namely – Domestic Sovereign, Supranational and MDB, GSE, Corporate, Statutory Multifamily Mortgages, HVCRE and others.

The rule is termed as "USA - US III - Non Sec RW Assignment based on asset class."

The mapping is as follows:

Basel II Asset Class	Risk Weight
Domestic Sovereign	0%
Supranational Entities	0%
Government-sponsored Entities	20%
Corporate Exposure	100%
Statutory Multifamily Mortgages	50%
High-Volatility Commercial Real Estate (HVCRE) Exposure	150%
Cash	0%
Cash items in the process of collection	20%
Other Asset	100%

### Other Sovereign Exposure

A new rule "USA - US III - Non Sec RW Assignment for Other Sovereign Exposures" is created to assign Risk weight based on Basel II Asset Class, Issuer CRC class, OECD Country Indicator and Sovereign Default Indicator.

The required source hierarchy is present. The mapping is as follows:

<b>Basel II Asset Class</b>	<b>Issuer CRC class</b>	<b>OECD Country Indicator</b>	<b>Sovereign Default Indicator</b>	<b>Risk Weight</b>
Sovereign Exposure	Issuer CRC class	OECD Country Indicator	Y	150%
Sovereign Exposure	CRC0	OECD Country Indicator	N	0%
Sovereign Exposure	CRC1	OECD Country Indicator	N	0%
Sovereign Exposure	CRC2	OECD Country Indicator	N	20%
Sovereign Exposure	CRC3	OECD Country Indicator	N	50%
Sovereign Exposure	CRC4	OECD Country Indicator	N	100%
Sovereign Exposure	CRC5	OECD Country Indicator	N	100%
Sovereign Exposure	CRC6	OECD Country Indicator	N	100%
Sovereign Exposure	CRC7	OECD Country Indicator	N	150%
Sovereign Exposure	No CRC	Y	N	0%
Sovereign Exposure	No CRC	N	N	100%

If an exposure, or the portion of an exposure, that is conditionally guaranteed by the S Government or FDIC or National Credit Union Administration, must assign 20% Risk weight through the rule "USA - US III - Mitigant RW Assignment for exposures Guaranteed by US Government".

## Certain Sovereign Exposures

As per the US Regulatory Capital Final Rule, wherein bank assigns to a sovereign exposure a risk weight that is lower than the applicable risk weight if:

- The exposure is denominated in the sovereign’s currency.
- The bank has at least an equivalent amount of liabilities in that currency; and
- The risk weight is not lower than the risk weight that the home country supervisor allows banks under its jurisdiction to assign to the same exposures to the sovereign.

In such cases, the conditions related to applying lower risk weight is more subjective in nature. Hence, the standard product does not have any specific rule for it. Other Risk weight assignment rules are customized to accommodate this requirement, if required.

Since the conditions related to applying lower risk weight is more subjective in nature, standard product does not have any specific rule for it. Other risk weight assignment rules must be customized to accommodate these requirements.

- **Certain supranational entities and Multilateral Development Banks (MDBs):** Exposures on MDBs which qualifies for 0% risk weight are classified as Supranational entities asset class through asset reclassification rules. The rule “USA - US III - Non Sec RW Assignment based on asset class” caters to Risk Weight assignment. Refer section Exposure to US Government for details of the mapping.
- **Exposures to Government-Sponsored Entities (GSEs):** The rule “USA - US III - Non Sec RW Assignment based on asset class” assigns 20% Risk Weight to an exposure to a GSE that are not an equity exposure or preferred stock. Also, a new rule “USA - US III - Non Sec RW Assignment - GSE Exposures on Preferred Stock” must be created to assign 100% Risk weight to preferred stock, based on Basel Asset class and Standard Product Type.

Basel II Asset Class	Standard Product Type	Risk Weight
Government-sponsored Entities	Preferred Stock	100%

- **Exposures to Depository Institutions, Foreign Banks and Credit Unions**

**Exposures to U.S. depository institutions and credit unions:** A new rule "USA - US III - Non Sec RW Assignment - Depository Institutions and Credit Unions" is created to assign risk weight based on Basel Asset class and Sovereign Default indicator.



Basel II Asset Class	Sovereign Default Indicator	Risk Weight
U.S. depository institutions and credit unions	Y	150%
U.S. depository institutions and credit unions	N	20%

The conditions for assigning 100% risk weights are handled in capital structure.

**Exposures to Foreign Banks:** A new rule “USA - US III - Non Sec RW Assignment - Foreign Banks” must be created to assign risk weight based on Basel II Asset Class, Issuer CRC class, OECD Country Indicator, Sovereign Default Indicator and Standard Product Type. For risk weight assignment for exposure to foreign bank, data of trade-related contingent items are expected to be related to only those contingencies that arise from movement of goods.

**Exposures to public sector entities (PSEs)**

- **Exposure to US PSEs:** A new rule ““USA - US III - Non Sec RW Assignment - US PSEs” is created to assign risk weight based on Basel Asset class and PSE Obligation Type. A new hierarchy for PSE obligation type is created and PSE Obligation Type data is available at an exposure level.

Basel II Asset Class	PSE Obligation Type	Risk Weight
US PSEs	General Obligation	20%
US PSEs	Revenue Obligation	50%

- **Exposures to Foreign PSEs:** A new rule ““USA - US III - Non Sec RW Assignment - Non-US PSEs” is created to assign risk weight based on Basel II Asset Class, Issuer CRC class, OECD Country Indicator, Sovereign Default Indicator and PSE Obligation Type. The mapping is as follows:

<b>Basel II Asset Class</b>	<b>Issuer CRC class</b>	<b>OECD Country Indicator</b>	<b>Sovereign Default Indicator</b>	<b>PSE Obligation Type</b>	<b>Risk Weight</b>
Foreign PSE	Issuer CRC class	OECD Country Indicator	Y	PSE Obligation Type	150%
Foreign PSE	CRC0	OECD Country Indicator	N	General Obligation	20%
Foreign PSE	CRC1	OECD Country Indicator	N	General Obligation	20%
Foreign PSE	CRC2	OECD Country Indicator	N	General Obligation	50%
Foreign PSE	CRC3	OECD Country Indicator	N	General Obligation	100%
Foreign PSE	CRC4	OECD Country Indicator	N	General Obligation	150%
Foreign PSE	CRC5	OECD Country Indicator	N	General Obligation	150%
Foreign PSE	CRC6	OECD Country Indicator	N	General Obligation	150%
Foreign PSE	CRC7	OECD Country Indicator	N	General Obligation	150%
Foreign PSE	No CRC	Y	N	General Obligation	20%
Foreign PSE	No CRC	N	N	General Obligation	100%

<b>Basel II Asset Class</b>	<b>Issuer CRC class</b>	<b>OECD Country Indicator</b>	<b>Sovereign Default Indicator</b>	<b>PSE Obligation Type</b>	<b>Risk Weight</b>
Foreign PSE	CRC0	OECD Country Indicator	N	Revenue Obligation	50%
Foreign PSE	CRC1	OECD Country Indicator	N	Revenue Obligation	50%
Foreign PSE	CRC2	OECD Country Indicator	N	Revenue Obligation	100%
Foreign PSE	CRC3	OECD Country Indicator	N	Revenue Obligation	100%
Foreign PSE	CRC4	OECD Country Indicator	N	Revenue Obligation	150%
Foreign PSE	CRC5	OECD Country Indicator	N	Revenue Obligation	150%
Foreign PSE	CRC6	OECD Country Indicator	N	Revenue Obligation	150%
Foreign PSE	CRC7	OECD Country Indicator	N	Revenue Obligation	150%
Foreign PSE	No CRC	Y	N	Revenue Obligation	50%
Foreign PSE	No CRC	N	N	Revenue Obligation	100%

The conditions related to applying lower risk weight is more subjective in nature; hence standard product does not have any specific rule for it. The risk weight assignment rules must be customized to accommodate this requirement.

#### **Residential Mortgage Exposures (RMEs)**

A new rule “USA - US III - Non Sec RW Assignment - Residential Mortgage Exposures” must be created to assign risk weight based on Basel II Asset Class, Non Sec Past Due Flag, Assumed Lien position on RME, Occupancy Type and Restructured indicator. Restructured indicator is expected as "No" when a residential mortgage exposure modified or restructured on a permanent or trial basis solely pursuant to the U.S. Treasury’s Home Affordable Mortgage Program (HAMP) assumption that prudent underwriting standard has been followed by the bank for the Residential Mortgage Exposure. The assumption is that prudent underwriting standard is followed by the bank for the Residential Mortgage Exposure.

The mapping is follows:

Basel II Asset Class	Non Sec Past Due Flag	Assumed Lien position on RME	Occupancy Type (v_occupancy_cd)	Restructured Indicator	Risk Weight
Residential Mortgage exposure	Non Sec Past Due Flag	Assumed Lien position on RME	Occupancy Type	Restructured Indicator	100%
Residential Mortgage exposure	N	First	Owner Occupied	N	50%
Residential Mortgage exposure	N	First	Rented	N	50%

The Non Sec Past Due flag, which is an existing hierarchy, indicates whether Residential Mortgage Exposure is past due or not.

Three new hierarchies must to be created for the rule:

- Assumed Lien position on RME:** It is necessary to identify whether exposure must be treated like a first-lien residential mortgage exposure or junior-lien RME. Lien Position is typically an attribute of mitigant. However, at the mitigant level, it must be specified as an absolute lien position number. It may not clarify whether the bank holds the first-lien and junior-lien(s) RMEs and no other party holds an intervening lien; and hence it is treated like first lien. Therefore, it is required to directly capture assumed lien position at an exposure level. More so, as there is a column v\_lien\_position\_cd in stg\_loan\_contracts, which may be brought to fct table and metadata may be defined on it. It is assumed that bank provides Lien position data as per the applicable treatment. This means, if the bank holds the first-lien and junior-lien(s) RMEs, and no other party holds an intervening lien then it must combine the exposures and treat them as a single first-lien residential mortgage exposure. In such case, Assumed Lien position on RME must be given as “First”.
- Occupancy Type:** The Occupancy Type indicates whether RME is “Owner-occupied” or “Rented” or “Others” (like, vacation home and so on; it is inferred that Owner-occupied means primary residence of the home loan borrower). There is a column v\_occupancy\_cd in stg\_loan\_contracts, which may be brought to fct table and metadata may be defined on it.

- Restructured Indicator** – It is to indicate that the loan is restructured for the key attributes like rate, amount, tenor and so on. The values could be “Yes” or “No”. There is a column `f_restructured_ind` in `stg_loan_contracts` for this purpose, which may be brought to fact table and metadata may be defined on it. The null values in the column may be treated as “No”. The condition regarding mortgage is made in accordance with prudent underwriting standards, including standards relating to the loan amount as a percent of the appraised value of the property; is an operational requirement. For the standard Basel product release, it is assumed that the bank has fulfilled this operational requirement before classifying such exposures eligible for 50% risk weight. If there are any exceptions to fulfill such due-diligence and, due to which, applicable risk weight is 100%; then the application must be customized accordingly.

### Pre-sold Construction Loans

The existing rule “USA - US III - Non Sec Pre-Mitigation RW Assignment - Pre-sold construction Loan - STD” can be used for treatment to Pre-sold construction loans.

### Past Due Exposures

A new rule “USA - US III - Non Sec RW Assignment for Past Due Exposures” must be created to assign 150% risk weight to uncovered portion of the exposure, based on Basel asset class (that is, except for US Government, Sovereign Exposure and Residential Mortgage exposure asset class) and past due flag.

### Other Assets

The rule “USA - US III - Non Sec RW Assignment based on asset class” caters to risk weight assignment for Cash, Cash items in the process of collection and other assets. Refer section exposure to US government for details of the mapping.

A rule "USA - US III - Non Sec RW Assignment - Gold" is created to assign zero percent risk weight to Gold asset class.

The requirement for assigning 100% risk weight for DTAs is covered in the rule- USA - US III RWA Calculation for DTA due to temporary Difference . The DTAs should be provided as net of any related valuation allowances and net of DTLs.

The requirement for assigning 250% risk weight for MSAs and DTAs is covered under capital structure. It is mapped to Credit RWA capital component group.

### Sold Credit Protection

The sold credit protection in the form of guarantees and credit derivatives is under the regulatory framework. The treatment specific to the sold credit protection are as follows:

#### a) Guarantees and Credit Derivatives

Protection Provided to Non-Sec Exposures: In the case of guarantees and credit derivatives provided to the exposures which are not securitized, the protection provided is treated as an exposure to the underlying reference asset.

#### b) Guarantees and Credit Derivatives

Protection Provided to Sec Exposures: In the case of guarantees and credit derivatives provided to the exposures which are securitized, the protection provided is treated as if the portion of the reference exposure is held by the protection provider.

**c) Nth to Default Credit Derivatives**

In the case of nth to default credit derivatives, it is risk weighted using SSFA approach. If the SSFA Approach is not applicable for the transaction, then it is risk weighted at 1250%.

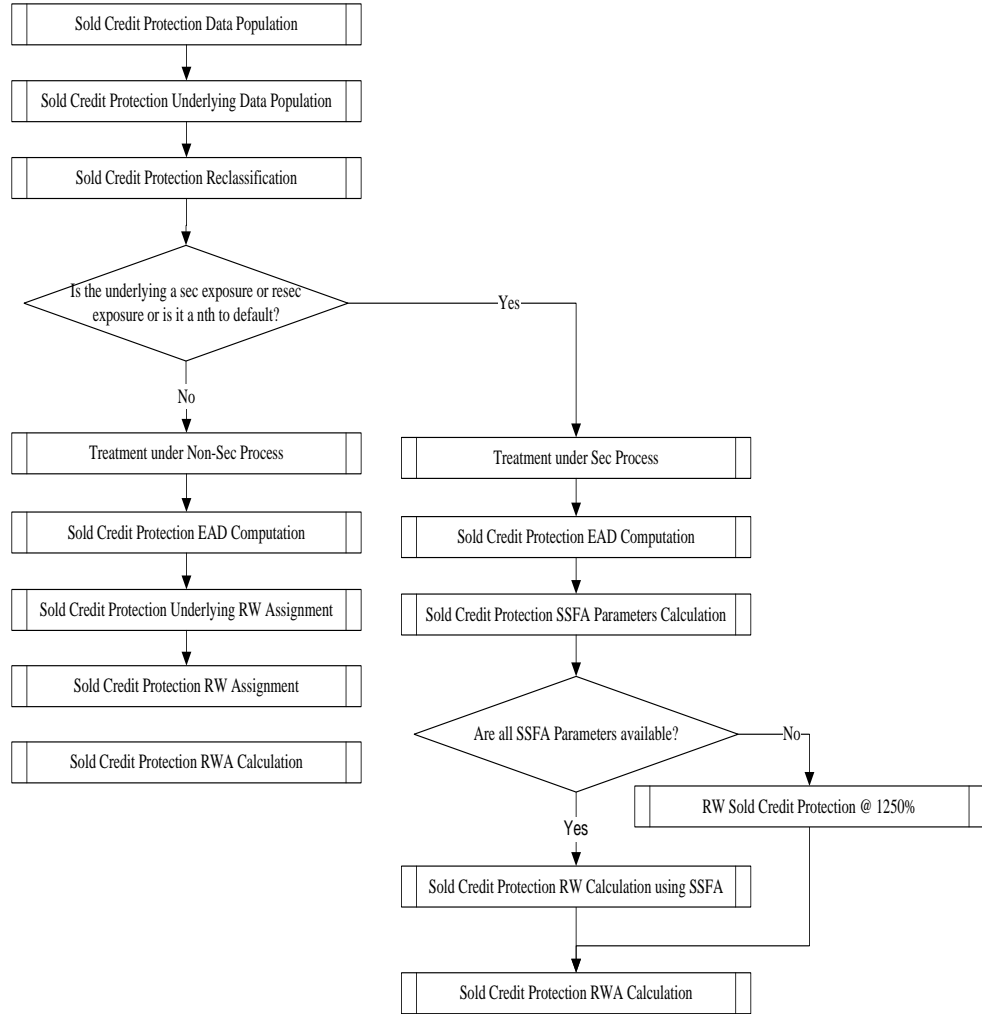
**Assumptions**

As per Accord:

- A bank that is the protection provider under an OTC credit derivative must treat the OTC credit derivative as an exposure to the underlying reference asset.

Interpretation in the application:

- This is a mention of the treatment for the credit derivative which is sold as credit protection to exposures which are not securitized.
- Guarantees and non- nth to default credit derivatives are treated using the same guidelines for the recognition of the credit risk mitigant and the treatment for protection provided to securitized exposures.
- And, it is not specified of the guarantees which are sold as credit protection to non-securitized exposures.
- Hence this has been assumed that the same treatment is applied for guarantees which are provided as protection to the non-securitized exposures.



## Sold Credit Protection Data Population

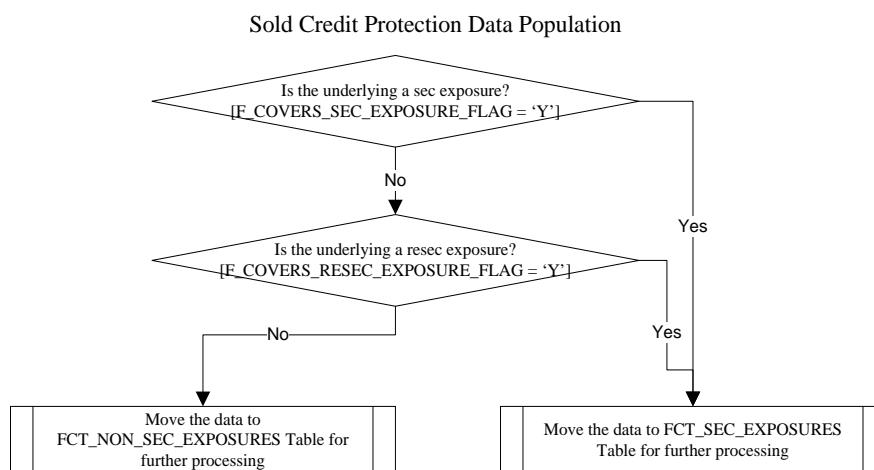
The sold credit protection data is specific to the sold guarantees and sold credit derivatives. These data is available in the product processor tables of STG\_GUARANTEES and STG\_CREDIT\_DERIVATIVES. These sold credit protection exposures has the following data:

“F\_COVERS\_SEC\_EXPOSURE\_FLAG” or “F\_COVERS\_RESEC\_EXPOSURE\_FLAG” has flag as “Y” in the case of the exposure satisfying the following condition:

- The sold credit protection is provided on a securitized or resecured exposure.
- In the case of nth to default credit derivative, unless the sold credit protection is provided to a resecured exposure, the F\_COVERS\_SEC\_EXPOSURE\_FLAG must be “Y”.

If the F\_COVERS\_SEC\_EXPOSURE\_FLAG or the F\_COVERS\_RESEC\_EXPOSURE\_FLAG have a value of “Y”, then these sold credit protection data is processed under securitization framework. Hence this has to be processed to FCT\_SEC\_EXPOSURES table.

Else, the sold credit protection data is processed under non-securitization framework. Hence is processed to FCT\_NON\_SEC\_EXPOSURES table.



## Sold Credit Protection Underlying Data Population

The underlying data are required for all the sold credit protection. The underlying data is provided in the STG\_UNDERLYING\_EXPOSURES table.

These underlying for the sold credit protection have the following data:

- V\_UNDERLYING\_DATA\_IDENTIFIER: The underlying of the sold credit protection have the “V\_UNDERLYING\_DATA\_IDENTIFIER” as “SCP”, to recognize this for the Sold credit protection treatment.
- V\_PARENT\_EXPOSURE\_ID: The underlying of the sold credit protection have the “V\_PARENT\_EXPOSURE\_ID” as the “V\_EXPOSURE\_ID” of the sold credit protection.



- In the case of guarantees and credit derivatives, there is only one underlying for the sold credit protection.
- In the case of nth to default credit derivative, there is more than one underlying for the sold credit protection.

These underlying for the sold credit protection is processed to the FCT\_NON\_SEC\_EXPOSURES table, wherein all the calculations required are processed. At the end of the processing, this is moved to the FCT\_SCP\_UNDERLYING table.

Note: If the underlying data for the sold credit protection are not provided, this is treated as sold credit protection, and hence is treated as a regular exposure.

### Treatment Specific to Sold Credit Protection

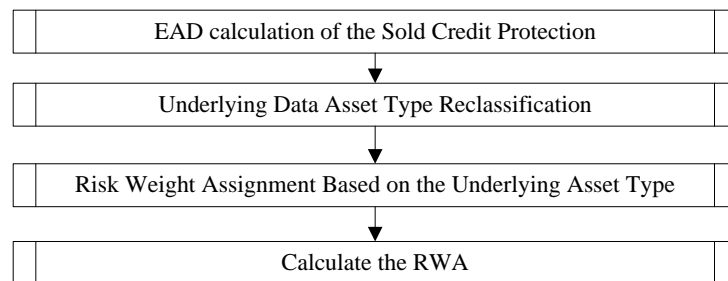
The sold credit protection is treated specifically in the case of the protection covering sec exposures and non-sec exposures.

#### 1. Sold Credit Protection covering Non-Sec Exposures:

- The risk weight for the sold credit protection is based on the underlying exposure's asset class.
- The risk weighting applicable based on the underlying exposure's asset class.

### Process flow for the Calculations

Treatment specific to Sold Credit Protection Covering Non-Sec Exposures



### EAD Calculation of the Sold Credit protection

- The EAD for the sold credit protection is equal to the notional amount of the contract.

### Underlying Data Asset Type Reclassification

- The asset type reclassification for the underlying of the sold credit protection is same as any other non-sec exposure Asset type reclassification. This is handled in the Non-Sec Exposures asset type reclassification.

### Risk Weight Assignment based on the Underlying Asset Type

- The risk weight assignment for the sold credit protection is based on the asset type of the underlying exposure, which is the same as any other non-sec exposure.
- The risk weight for the underlying exposure is calculated and this is updated to the sold credit protection exposure.

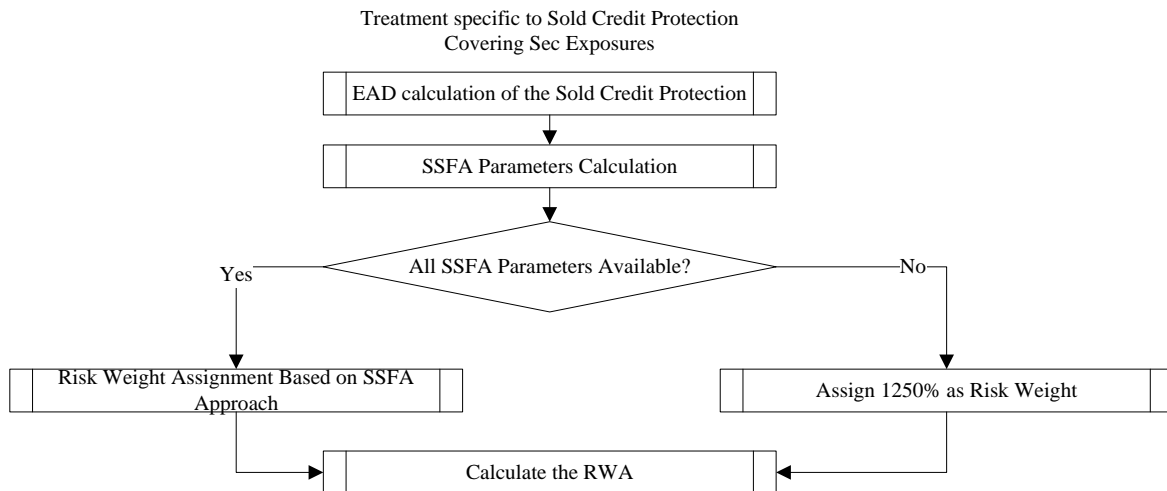
### Calculate the Risk Weight Assessment

- 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.

### 2. Sold Credit Protection covering Sec Exposures:

- The risk weight for the sold credit protection is calculated using the SSFA Approach.
- If any of the SSFA parameters are not available for calculation, then the sold credit protection is risk weighted 1250%.
- Hence the hierarchy of approaches for SCP is, SSFA Approach and Risk Weight @ 1250%
- This hierarchy of approaches is different from the securitization exposures.

### Process flow for the Calculations



### EAD Calculation of the Sold Credit protection

- The EAD for the sold credit protection is the notional amount of the transaction.

- In the case of nth to default credit derivative, the EAD is the largest notional amount of all underlying exposures.

### SSFA Parameters Calculation

- a) In the case of nth to default credit derivative, the pool parameters of SSFA (Kg, W and p) are calculated in the same manner as any other securitized exposure.

The tranche parameters A and D are calculated differently, from the calculation for the securitized exposures. They are calculated as follows:

- Parameter A:
    - It is calculated as the ratio of the sum of the notional amount of all underlying exposures that are subordinated to the bank's exposure to the total notional amount of all underlying exposures.
    - The smallest (n-1) exposures are subordinated to the bank's exposure.
  - Parameter D
    - It is equal to Parameter A + the ratio of the notional amount of the bank's exposure to the total notional amount of all underlying exposures.
- b) In the case of guarantee and credit derivative, the pool parameters of SSFA (Kg, W and p) and the tranche parameters (A and D) are calculated in the same manner as any other securitized exposure.

### Check to find whether all the SSFA Parameters are available

- There is a check to identify whether all the SSFA parameters (KG, W, p, A and D) are available for the sold credit protection exposure.
- If yes, then the risk weight is calculated as per the SSFA Approach,
- If not, then the sold credit protection must be assigned 1250% Risk weight.

### Calculate the RWA

- 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 one and the same since there are no mitigants for these exposures.

### Simple Risk-Weight Approach (SRWA)

Assigning Risk weights based on equity issuer, and categorization of Risk Weights and calculation of RWA is similar to US Advanced Approach.

This means:

**Risk Weight** = 0% for equity exposure to Standard party type Sovereign, Highly Rated Multilateral Development Bank, Multilateral Development Bank, US Government

**Risk Weight** = 20% for equity exposure to Standard party type US PSE, Federal Home Loan Bank or the Federal Agricultural Mortgage Corporation (Farmer Mac)

**Risk Weight** = 100% for equity exposure to Community Development Institution, effective portion of a hedge pair, Non-significant equity exposures.

Effective portion of a hedge pair is calculated from effective hedge wherein two equity exposures either have the same remaining maturity or each has a remaining maturity of at least three months; the hedge relationship is formally documented in a prospective manner specifying measure of effectiveness (E). A hedge is called effective if measure of effectiveness (E) is greater than or equal to 0.8. This condition is same as in Advanced approach and US Basel II. Additionally, the calculation of effective and ineffective portion of hedge pair also remains same as in Advanced approach and US Basel II.

The definition of Non-significant equity exposures remains same as in the advanced approach.

Which is,

**Risk Weight** = 250% for Significant investments in the capital of unconsolidated financial institutions in the form of common stock that are not deducted from capital. This is same as in advanced approach.

**Risk Weight** = 300% for Publicly-traded equity exposure and other than those equity exposure that receives 600 percent risk weight

**Risk Weight** = 400% for Equity exposure that is not publicly-traded and other than those equity exposure that receives 600 percent risk weight

**Risk Weight** = 600% for Equity exposure to an investment firm meeting the definition of a traditional securitization and has greater than immaterial leverage. These conditions are same as in Advanced approach.

For the equity exposure to investment funds, Look-through approaches, Full look-through, Simple Modified look-through, Alternative modified look-through approach, are used. The Risk Weighted Asset amount is calculated based on the underlying exposures of the fund and risk weight as applicable according to the selected look-through approach as specified in the final rule.

Most of the rules and processes used for Equity exposure treatment in US Advanced approach can be used for Equity exposure treatment in US Standardised approach; except following changes:

- A rule “US - US III - STD - Equity RW Assignment for Sovereign Fed Home Loan and Community Development – SRWA” is created in the sub-process “Equity Exposures - Simple Risk Weight Method” for Standardised approach run. This is similar to the rule “USA - Equity Non Inv Fund RW Assignment Hedge Pair – SRWA” in the Advanced approach run.

The mapping for Risk Weight Assignment is as follows:

Basel II Asset Class	USA - Non Investment Fund Equity Approach	Standard Equity Issuer Type	Risk Weight
Equity Exposures	Simple Risk Weight Approach	Sovereign	0%
		Highly Rated Multilateral Development Bank	0%
		Multilateral Development Bank	0%
		US Government	0%
		Federal Home Loan Bank	20%
		Government Sponsored Entities	20%
		US PSE	20%
		Community Development Institution	100%

- A rule “US - US III - STD - Equity RWA Calculation for Sovereign Fed Home Loan And Community Development – SRWA” is created, for RWA calculation, in the sub-process Equity Exposures - Simple Risk Weight Method in standardized approach run. It is similar to calculation rule USA - Equity RWA Calculation for Sovereign Fed Home Loan And Community Development – SRWA in the Advanced approach run, is replaced with RWA calculation formula and, hence, the associated BP is same as in US advanced approach. However, the following is the mapping for Standard Equity Issuer type:

Basel II Asset Class	USA - Non Investment Fund Equity Approach	Standard Equity Issuer Type
Equity Exposures	Simple Risk Weight Approach	Sovereign
		Highly Rated Multilateral Development Bank
		Multilateral Development Bank
		US Government
		Federal Home Loan Bank
		"Government Sponsored Entities
		US PSE
		Community Development Institution

- Hedge Effectiveness and Calculation of Effective Portion of Hedge pairs:- Two equity exposures form an effective hedge if the measure of hedge effectiveness is  $\geq 0.8$ , in addition to the other conditions on remaining maturity and documentation criteria. The measure of hedge effectiveness is given as download (n\_msr\_hedge\_effectiveness). Effective Portion of hedge pair is calculated through DT CAL\_EFF\_PORTION\_HEDGE.

While calculating the effective Portion of the hedge, check if the measure of hedge effectiveness is greater than or equal to 0.8.

Which means,

IF Hedge Effectiveness Measure  $\geq 0.8$

Then,

**Effective Portion of Hedge Pair** = Hedge effectiveness measure X greater of the adjusted carrying values of the equity exposures forming a hedge pair.

**Ineffective Portion of Hedge Pair** = (1- Hedge effectiveness measure) X greater of the adjusted carrying values of the equity exposures forming a hedge pair.

Else,

**Ineffective Portion of Hedge Pair** = Greater of the adjusted carrying values of the equity exposures forming a hedge pair.

Ensure to check if it calculates the effective portion of hedge pair, it is required to have a check on value of measure of hedge effectiveness.

- Significant investments in the capital of unconsolidated financial institutions that are not deducted from capital, as per capital structure treatment is mapped to Credit RWA capital component group. The risk weight of 250% is applicable to such equity exposures.

## Mitigant Eligibility and Haircut Assignment

### Overview

As per the Regulatory Capital rules guidelines, BCBS recognizes the need to change certain criteria in the eligibility of mitigants due to the economic crisis of 2008. It has revised the criteria for recognition of the eligible mitigants, applicable for both the Securitized and the Non-Securitized exposures. The US regulator has also revised the haircuts to be applied for the debt securities issued by a securitization transaction which act as collateral. These changes are an outcome of the financial crisis of 2008, as these transactions are sensitive to fluctuations in the price. This is applicable in the case of Standardized Approach and Advanced Approach for US.

The process flow for CRM is the same as in the existing Basel II computation except for a few differences. The differences are in the Mitigant Eligibility and the Mitigant Haircut Assignment procedures. The Mitigant Eligibility depends on the original ratings in the case of Securitized exposures. Hence, this has an effect on the credit rating processing.

All the rating information of the mitigants is populated from the staging tables to the processing tables. The mitigants rating information are captured in the instrument rating details. The flag Y in the **F\_ORIG\_CREDIT\_RATING\_IND** indicates that the rating is the original rating or the rating of the instrument at the time the protection was given and N indicates that the rating is the current rating.

This is handled in the **CREDIT\_RATING\_PROCESSING** process.

Also, multiple assessment is performed for the mitigants current rating as well as the original rating. This is handled along with the multiple assessment of the exposures.

The Mitigant Eligibility, Mitigant Risk Weight, Haircut Assignment, and Allocation of Mitigants to Exposures are handled in CRM sub process.

- **Mitigant Eligibility:**

The application identifies the eligible mitigants based on the criteria as mentioned by the US Regulatory Capital Rules. The application identifies the following mitigants– collateral, guarantees, and credit derivatives. The application is capable of using the Simple Approach as well as the Collateral Haircut 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 Collateral Haircut Approach. The eligibility of the collateral mitigants are based on issue of the mitigant, mitigant types, the credit rate with investment grade assigned to the party (as applicable), and the classification of collateral as senior or not. For equity, the eligibility is based on the equity trading status.

The application also identifies whether the mitigant is a Re-securitized exposure and if yes, makes it ineligible. 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 based on the satisfaction of the criteria as specified in the US Regulatory Capital Rules. All the guarantees and credit derivative issued by issuers who are reclassified as Other Entities are treated as eligible for Non Securitization exposures if at the time the guarantee is issued or anytime thereafter, has issued and outstanding an unsecured debt security without credit enhancement that is investment grade. All the guarantees and credit derivative 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 US Regulatory Capital Rules. For processing the original rating of these issuers, the solution performs the multiple assessments of the initial ratings. This is performed by the Data Transformation “Mult\_Asses\_Initial”. The details of the Data Transformation for Securitization are as follows:

Data Transformation Name	Objective	Processing Logic
Mult_Asses_Initial	The objective of this Data Transformation is to perform multiple assessments of the initial ratings and assign a normalized rating and risk weight to the mitigants. This is specific to the Basel III Securitization CRM framework.	For each mitigant, the various standard ratings associated with that mitigant as of the time it was initially issued and the respective risk weights are identified. If the number of ratings are 1, then the same rating gets assigned as the standard initial rating for the mitigant. If the number of ratings are greater than or equal to 2, then the mitigant is assigned a standard initial rating which corresponds to the worst of the best two risk weights associated with the initial ratings assigned.

- **Haircut Assignment:**

The application assigns the various haircuts, as applicable to the Mitigants. For collateral following Simple Approach for recognition, no haircuts are assigned to the mitigant. For collateral following the Collateral Haircut Approach, the application is flexible to use the supervisory haircuts and scale up, if required, based on the minimum holding period. The application can also use the bank's own estimate of haircuts. The application applies the volatility haircut, FOREX haircut, and the maturity mismatch haircut to the mitigants as appropriate. This is as per the US Regulatory Capital Rules regulations. The volatility haircuts for debt securities which are mitigants have been modified to include the Securitized exposures.

Only eligible mitigants are considered for haircut assignment. The eligible mitigants are moved from mitigants table to sub exposures table.

The CRM change is applied in the following processes:

- USA - US III - Non-securitization Exposure Treatment – STD
- USA - US III - Securitization Exposure Treatment - STD

This is applicable for Basel III Standardized Approach, Advanced Approach. This change has an impact for both the Securitized Exposures and the Non-Securitized exposures.

### **Key Data Elements**

For a complete list of tables and columns to be updated refer to the Download Specifications document.

#### *For Mitigants*

- Re-securitized exposures Mitigant – The mitigants belonging to re-securitized exposures will have “Y” value in this field. The is marked as ineligible mitigants.
- Securitized exposures Mitigant – The mitigants belonging to securitized exposures will have “Y” value in this field. The application assigns different volatility haircuts for these, depending on the current ratings and the residual maturity.

#### *For Ratings*

- Current Rating for the Guarantees and Credit derivatives issued to Non-Securitized Exposures.
- Current Rating and Original Rating for the guarantees and credit derivatives issued to Securitized Exposures.

## **Securitization**



The US Regulatory Capital Rules differentiates the Credit Risk computation of the Securitized exposures from Non Securitized exposures. As securitized exposures are part of off-balance sheet transactions, it follows a waterfall cash flow mechanism unlike the other exposures. Hence these exposures are treated differently. Due to the economic crisis of 2008, the Basel Rule has categorized securitized exposures into securitized and re-securitized exposures.

Securitized exposures are exposures which are issued out of a pool of underlying exposures for the transfer of risk. Re-securitized exposures are the exposures which are issued out of a pool of underlying exposures which constitutes non-securitized exposures as well as some portion of securitized exposures. The application is capable of handling both securitized exposures as well as re-securitized exposures. It also handles the calculation for the originator as well as the investor bank roles. At a broad level, there are two categories of Investors:

- An Investing Bank who has invested heavily in securitization:

These investors are prepared to provide the entire details of the securitization transaction

To cater to these investor needs, the entire pool, entire or invested tranche details, and the invested exposures information are required to be provided by the bank. This information is captured in the pool, tranche, and exposures table.

- An Investing Bank who has invested minimal in securitization:

These investors are prepared to provide the necessary inputs required for the calculation of the capital charge pertaining to their invested exposure.

To cater to these investor needs, the invested exposures information is required to be provided as an input by the bank. A few pool and tranche attributes required for the computation are also to be provided as an input by the bank in the Stage Securitization Exposures Table (**STG\_SEC\_EXPOSURES**).

The US Regulatory Capital Rules specifies two broad approaches for the calculation of the capital charge for the Securitization exposures:

## **Securitization – Standardized Approach**

Due to the economic crisis in 2008 and other amendments brought in by the Dodd-Frank Act, US III has revised the treatment of securitized exposures. The application supports the following revised hierarchy of approaches for securitization exposures:

- Gross up Approach
- Simplified Supervisory Formula Approach (SSFA)
- Risk Weight at 1250%

### ***Assumptions***

The following is an interpretations pertaining to SSFA:

- In sec USA, investment grade is not based on Ratings... so for low rated exposures, CRC ratings of the Originator will be used for applying risk weight to the low rated exposures.

The below interpretation is pertaining to Gross up Approach

- Banks which are not subject to market risk rule can only opt for Gross up Approach Assuming that the Bank is aware of its trading activity portfolio (for the Market Risk Rule Check), the Bank will provide the approach selection that it wants to apply to all its sec exposures.

A few of the interpretations pertaining to SSFA are as follows:

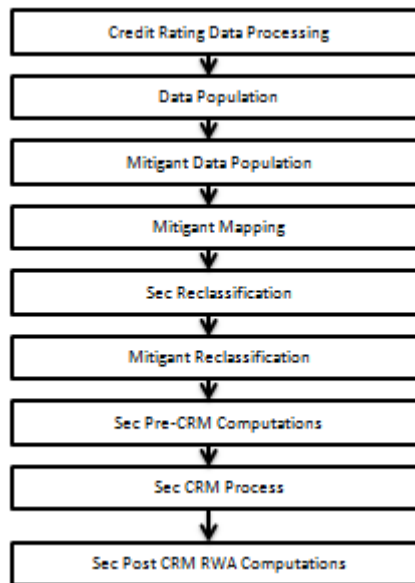
- Investment grade are ratings equivalent to BBB- or above
- Low ratings are ratings equivalent to BB+ or below

The below interpretation is pertaining to Gross up Approach

- Banks which are not subject to market risk rule can only opt for Gross up Approach Assuming that the Bank is aware of its trading activity portfolio (for the Market Risk Rule Check), the Bank will provide the approach selection that it wants to apply to all its sec exposures.

### ***Process Flows for Securitization – Standardized Approach***

The process flow for Standardized Approach of Securitization exposures are as follows:



The only change in the computation of the [Securitization - Standardized Approach](#) process, in the Basel III processing of the current release of the application is in the Sec Pre-CRM Computation Process. Under this process, for Sec Deduction Process, the exposures which are lower than the investment grade and the unrated exposures are risk weighted at 1250%.

For more information on the processing of the remaining line items Securitization –Standardized approach process flow, refer *Securitization* on page **Error! Bookmark not defined.**

- **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**) tables and the mitigant rating information is captured in the instrument rating details (**STG\_INSTRUMENT\_RATING\_DETAILS**) table. Though the ratings are no longer relevant, the investment grade criteria are handled in the application with the help of these ratings. Any rating below BBB, are all non-investment grades and are low rated. The rating processing is handled in the process **USA Credit Rating Processing**.

- **Securitization and Mitigant Data Population with Mitigant Mapping**

The data pertaining to the pool, tranche, and exposures are populated from the staging tables to the processing tables. The underlying exposures data are captured in the respective product processor tables for originator records. The underlying exposures are captured in the underlying exposures (**STG\_UNDERLYING\_EXPOSURES**) table for investor and sold credit protection. The underlying exposures data follows the process pertaining to the non securitization exposures. The securitization transactions which are backed by non-financial assets or by operating companies, are excluded from

the securitization treatment. They are instead treated as non-securitization exposures. For reporting bank providing only the exposure level information, the application expects a few pool level and tranche level parameters, which are required for further processing, to be provided in the exposures (STG\_SEC\_EXPOSURE) table. Exposures created out of re-tranching of single asset such as Re-Remic positions need not be treated as re-securitization positions. Exposures which are created by re-tranching a single asset (like Re-Remic positions) are treated as securitization exposures, as mentioned by the accord. Case where bank has provided clean up call, that is:

If Eligible clean up call indicator = 'Y', then the call option exposure will be a part of Sec RWA.

If Eligible clean up call indicator = 'N/Null', then the call option exposure which includes all the underlying exposures associated with securitization will be a part of Non- Sec RWA.

If Implicit support indicator = 'Y', then the exposure will be a part of Non-Sec RWA.

If Implicit support indicator = 'N/Null', then the exposure which includes all the underlying exposures associated with securitization will be a part of Sec RWA.

For Sec portfolio reporting purpose, capital of sec exposures belonging to the pool on which originator has provided implicit support will be 0.

If a securitization (1) includes one or more underlying exposures in which the borrower is permitted to vary the drawn amount within an agreed limit under a line of credit, and (2) contains an early amortization provision, then Risk based capital for these transferred exposures will be calculated as per non securitization framework.

If bank has provided Early amortization provision, i.e. at pool level, pool type= Revolving and Early amortization type is:

- Controlled committed Early Amortization Provision
- Controlled uncommitted Early Amortization Provision
- Uncontrolled committed Early Amortization Provision
- Uncontrolled uncommitted Early Amortization Provision

Then RWA for the above condition will be calculated as per non sec framework i.e. Rwa will be calculated for the Underlying of the Pool and for regulatory purpose, RWA, EAD and Risk weight for the securitized exposures will be updated as zero. Early amortization type is expected as a download value at pool level.

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. Securitization data population is handled by the process US III Sec Data Population. Mitigant data population is handled by the process USA Mitigant Data Population and exposure mitigant mapping population is handled in the process USA Sec Exp Mitigant Mapping Pop.

- **Sec Reclassification**

The application uses the standard data for all kinds of calculations (product type like Eligible Liquidity Facility, bank role like Originator, pool type like Mortgage Backed Securities). Before any calculation, the application reclassifies the bank specific data to standard data. The application reclassifies the bank role to the standard bank role of an Originator or Investor. Other bank roles like Sponsor, Credit Protection Provider, and so on, are reclassified into Originator, Investor, and so on, respectively. The application also reclassifies the pool type to the standard pool type like Credit Cards Receivable Pool, Auto Loans, and so on. The application also reclassifies the product type to the standard product type like Mortgage Backed Securities, Eligible Liquidity Facility, and so on. It reclassifies the mitigant type to the standard mitigant type like the Debt Securities, Credit Derivative, Cash, and so on. It reclassifies the mitigant issuer type to the standard mitigant issuer type like Banks, Corporate, and so on. These reclassification tasks are present in **Sec Reclassification** sub process.

- **Approach Selection**

- **Due Diligence Requirement for securitization exposures:**

Except for exposures that are deducted from CET1 capital and exposures which are subject to Small-business loans and leases on personal property transferred with retained contractual exposure, if a banking organization is not able to meet due diligence requirements, it would be required to assign a risk weight of 1250% to the exposures.

Due diligence requirement includes a comprehensive understanding of features of securitized exposures which could affect the performance of the exposures which includes:

- Conducting an analysis of the risk characteristics of a securitization exposure prior to acquiring the exposure,
- Understanding the Structural features of securitization that would materially impact the performance of the exposure,
- Relevant information regarding the performance of the underlying credit exposure
- Relevant market data of the securitization.

If a banking organization is able to meet due diligence requirements, a Bank can opt for SSFA, Gross up Approach or 1250% risk weight consistently to all its securitized exposures. For all the three approaches (opted by the bank), based on data availability, methodology will be assigned by the application. If the exposures are not qualified for the approaches opted by the bank, the exposures are risk weighted at 1250%.

The application assigns the appropriate approach to the exposures, based on the criteria specified in the US III. SSFA parameters Kg for re-securitization positions are arrived by using capital of underlying securitization positions.

These approaches are applicable for all the bank roles. If the bank has opted for Gross up Approach for all its securitized exposures, the same cannot be assigned to the sold credit protection to calculate the risk weight, instead it will be risk weighted @ 1250%. This approach selection is handled in the sub-process **Sec Approach Selection**.

That is, in case of re-securitization positions, if any of the underlying securitization positions are using any approach other than SSFA (Example: 1250%), the solution will not assign SSFA for re-securitization position.

### **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, after the Gross up Approach or Simplified Supervisory Formula Approach Risk Weight Assignment Rules are computed. For SBOC pool type if bank satisfies the following two condition, that is:

- Bank has to be a qualified institution, that is, well capitalized bank or reclassified as adequately capitalized bank with the approval by the regulation.
- Total obligation retain by the bank cannot exceed 15% total capital. If bank satisfies the above criteria, then RWA will be added to sec RWA else to Non sec RWA.

With respect to the treatment for transfer of a small business loan or lease of personal property with recourse, following operational criteria should be met:

- The transaction must be treated as a sale under GAAP. It should be a true sale.

- o Banks maintains a Non-Capital Reserve as per GAAP, sufficient to meet the estimated liability under the contractual obligation.

Pre-CRM EAD Computation:

The application assigns the Credit Conversion Factor (CCF) to the off-balance sheet items, For Eligible Liquidity facility, CCF assignment is based on Approach selection. Further, it computes the Pre-Mitigation EAD based on whether the exposure is an off-balance sheet item or not. On balance sheet EAD is calculated based on AOCI Opt out option and Exposures Available for sale indicator. For sold credit protection, the maximum notional amount of all the underlying exposures is the Pre-CRM EAD. This is handled in the sub-process Sec Pre-CRM EAD Computation. For sold credit protection in the form of nth to default credit derivatives, the maximum notional amount of all the underlying exposures is the Pre-CRM EAD. For sold credit protection in the form of guarantees, Pre-CRM EAD amount is made equal to minimum of notional amount of protection sold as against sum of exposure amount of products covered by guarantee.

Risk Weight Assignment:

*Simplified Supervisory Formula Approach:*

For exposures following the Simplified Supervisory Formula Approach, the application expects the underlying weighted average capital requirement of the securitization pool (KG) as an input. Other inputs needed for SSFA are parameters w, A and D. These can be provided either as an input, or can be calculated by the solution based on underlying data. Ensure that underlying securitized and underlying non securitized data is considered in case of resecuritization for calculation of parameter W. The application also sums up the non-performing balance of the underlying exposures under each of the specified status like 90 or more days delinquent, 90 or more days with deferred interest, default, foreclosure, bankruptcy, and REO and uses the sum for parameter w calculation as per US III.

Later, the application calculates the tranche parameters A and D based on the subordinated tranche balance and the subordinated funded reserve balance and the tranche balance, as specified by the US III. The solution calculates the balance of the subordinated funded reserve balance using the Data Transformation “Subrdntd\_Fnnd\_Amt\_Pop”.

For sold credit protection in the form of nth to default credit derivative, the tranche parameters A and D are calculated based on the underlying exposures. The parameter A is determined by using the sum of the least n-1 risk weighted assets’ notional amount as the numerator and the sum of the notional amount of all the underlying exposures as the denominator. This calculation of tranche parameters of A and D happens using the Data Transformation “TRANCHE\_A\_D\_CALC\_SCP”.

The details of the Data Transformation are as follows:

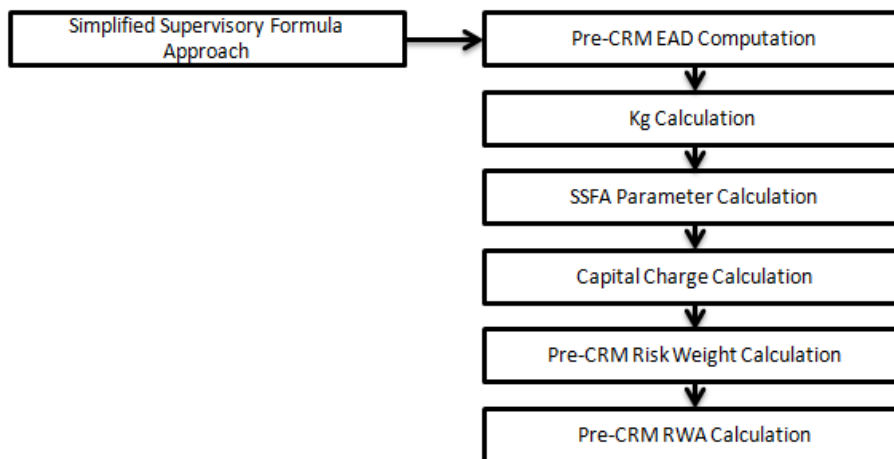
Data Transformation Name	Objective	Processing Logic
Subrdntd_Fnnd_Amt_Pop	The objective of this Data Transformation is to calculate the sum of the subordinate tranche amounts of a securitization tranche.	For each tranche, pick the tranches which junior to the current tranche, sum those tranche's amount and update FCT_SECURITIZATION_TRANCHE.n_subordinated_tranches_amt. Similarly sum the funded reserves of the junior tranches and update FCT_SECURITIZATION_TRANCHE.n_funded_reserve_amount.

Data Transformation Name	Objective	Processing Logic
TRANCHE_A_D_CALC_SCP	The objective of this Data Transformation is to calculate SSFA parameters - Attachment Point and Detachment Point for exposures that arise as a result of sold credit protection (SCP) in the form of nth to default credit derivative.	EAD for Sold credit protection & Guarantees covering the sec exposures is calculated. A is calculated as [Sum of the notional amount of the n-1 least risk weighted amount of the underlying covered by the credit protection] / Sum of the notional amount of all underlying exposure covered by the credit protection. D is calculated as A + [Notional Amount of the Protection Provided / Sum of the notional amount of all underlying exposure covered by the credit protection] where Maximum EAD of underlying exposures is assigned as Notional Amount of the Protection Provided.

For sold credit protection other than nth to default credit derivative (example total return swap), all parameters are calculated using the same methodology for normal securitization positions. Like any other securitization position, you can also provide values of some parameters as a direct input to the application.

Once all the SSFA parameters are calculated, the application calculates the capital charge ( $K_{SSFA}$ ) of the exposures and hence the risk weight of the exposures. The application also checks the exposure to identify whether the exposure should be straddled or not, depending on the parameters A, D, and  $K_A$ . Based on the satisfaction of the straddling criteria, the exposures are risk weighted using the straddling risk weight formula or the normal risk weight formula. In this case, there will be no splitting of the exposures as the straddling risk weight formula takes care of the splitting in one formula.

This is handled in the **Sec Pre-CRM RWA Computation** sub-process. The process flow for Simplified Supervisory Formula is as follows:




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Note: Due to the hierarchy of approaches, all Sec Exposures which have valid Pool and Tranche level data go through and not SSFA. The remaining will undergo 1250% risk weight approach.

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*Risk Weight at 1250%:*

Bank can also opt to apply 1250% risk weight if it doesn't choose SSFA or Gross up approach. All exposures, for which no approach is assigned, are risk weighted 1250%. Also, any exposure to which SSFA is assigned and the tranche SSFA parameter D is less than pool SSFA parameter Ka or the application is unable to calculate any of the SSFA parameters, then the exposures are risk weighted 1250%.

Also, the following exposures are assigned 1250% risk weight regardless of the approach selected.

- Exposures belonging to credit enhancing interest only strips,
- Low rated securitization exposures
- Exposures which are below  $K_{IRB}$  for

This is computed in the **Sec Pre-CRM RWA Computation** sub-process, under the applicable approaches.

*Risk weight assignment for exceptional cases:*

Few of the exposures, regardless of the approach selected, are risk weighted as applicable to the standard product type. The application assigns the risk weight for the Eligible Liquidity Facility as the maximum risk weight of the underlying exposures. The application assigns the risk weight for the second loss position as the maximum of 100% and the maximum risk weight of the underlying exposures. In both these cases, if maximum risk weight of underlying exposures is not available, then it will assign them 1250% risk weight. As per the US Regulatory Capital Final Rules, the bank is required to assign the risk weight of at least 100% for a non-credit-enhancing interest-only mortgage-backed security. This exception in risk weight assignment is handled after the Gross up Approach or Simplified Supervisory Formula Approach tasks in the **Sec Pre-CRM RWA Computation** sub process.

For capital calculations of re-securitized positions, information of underlying exposures capital (SSFA this data is required for Kg calculation) is required as a direct input in the application. Hence, the application first calculates capital for all securitized positions and then calculates those parameters for SSFA that are dependent on underlying securitized positions' capital.

*Gross up Approach:*

For all the Exposures, for which the Bank are not subject to market risk rule choose to apply Gross Up Approach instead of SSFA . They are able to calculate all the parameters required for the Gross up Approach, and qualify them. Else, the exposures is applied a risk weight of 1250%.

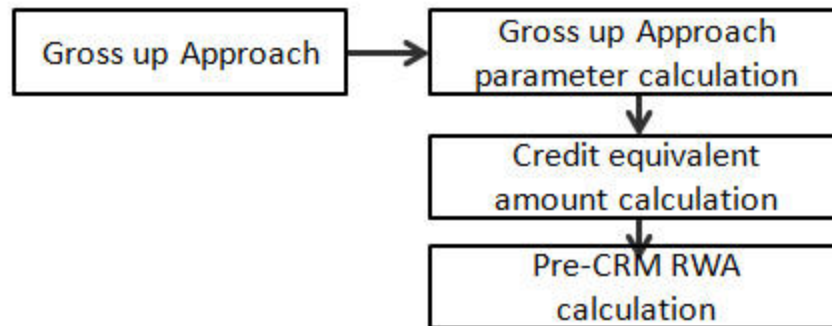
The Risk weight computed using the Gross up approach has a floor of 20%. That is, the Risk weight of the exposures will be a maximum of 20% and the calculated risk weight.

To use the gross-up approach, a Bank calculates the following four inputs:

1. Pro rata share – value of the bank’s exposure as a percent of the tranche that contains the exposure. It is expressed as a value between zero and one.
2. Enhanced amount – value of tranches that are more senior to the tranche containing the bank’s exposure.
3. Exposure amount – of the bank’s exposure.
4. Risk-Weight – weighted average risk-weight of underlying exposures of the securitization. Risk weight is calculated as per standardized approach for underlying exposures. Maximum risk weight that can be assigned is 1250% that is; it is capped at 1250%.

Above mentioned parameters are applicable for both sec and Resec except that the calculation of weighted average risk weight is different for resec. For resec, both the underlying sec and non sec is required to calculate weighted average risk weight.

The process flow for Simplified Supervisory Formula is as follows:



To calculate RWA for gross up approach, multiply risk weight and credit equivalent amount.

- **Sec CRM Process**

Mitigant eligibility, mitigant risk weight, haircut assignment, and allocation of mitigants to exposures are handled in **Sec CRM** sub-process.

**Mitigant Eligibility:**

The application identifies the following mitigants in the case of securitized exposures – collateral, guarantees, and credit derivatives. The mitigants are identified as eligible, based on the eligibility criteria as specified by the US III. For collateral, the eligibility is based on the criteria whether the mitigant is a re-securitized exposure, belongs to the investment grade, a standard mitigant type, and whether the mitigant belongs to the conforming residential mortgage. For guarantees and credit derivatives, the eligibility criteria are based on the issuer type and the satisfaction of the other criteria as specified in the US III.

**Mitigant Risk Weight:**



The application assigns the risk weight to the financial collateral based on the issuer type and the Country Risk Classification (CRC) assigned, if applicable. The risk weight to the guarantees and credit derivatives are assigned based on the PD, LGD, and the correlation calculated for the mitigant. The financial collateral issued by different issuers and belonging to various CRC classes, is assigned different risk weights as per specified in the US III. Also, countries which have defaulted are assigned a different risk weight. In the case of financial collateral by foreign banks, the application assigns the ratings based on the foreign bank's country code.

#### Haircut Assignment:

The application assigns the various haircuts, as applicable to the mitigants, specified by the US III. This is based on the risk weight assigned to the mitigant, standard issuer type, and the residual maturity associated with that mitigant. The minimum holding period of the financial collateral is 65 business days. The mitigant volatility haircut can be scaled up if the minimum holding period is more than 65 days.

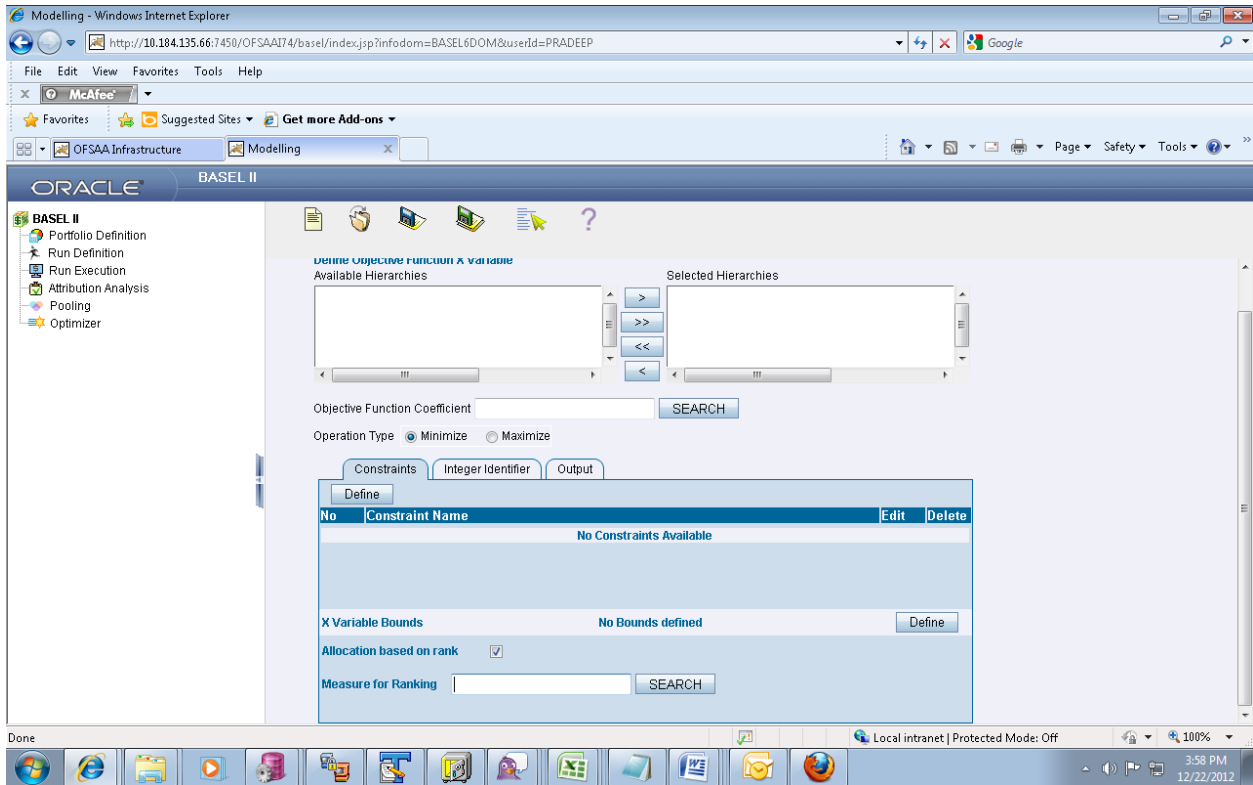
The same scaling up is done for FOREX haircut. Once the haircut assignment is complete, zero risk weight is assigned to financial collaterals. Only eligible mitigants are considered for haircut assignment and for further processing. Post haircut assignment, the eligible mitigants are moved from mitigants table to sub exposures table.

#### Allocation of Mitigants to Exposures:

The application computes the mitigant value post all haircuts. Then it uses the pooling and optimizer logic to allocate the exposures to the mitigants. This is slightly different from the optimizer logic of non-securitization exposures as the securitization exposures have priority in the cashflow and the senior most exposure (or tranche) gets the maximum protection by the mitigants. The senior most exposure (or tranche) is denoted with seniority 1 and the second senior exposure is denoted with seniority 2 and so on. For mitigant allocation of securitization exposures, senior exposures are given preference over junior exposures. The other parameters which are considered in the allocation logic are the risk weight and the mitigant value post haircut.

The application uses the linear programming logic to allocate the mitigants to the exposures. The pooling logic in securitization is the same as that of non-securitization. The optimizer logic for securitization is slightly different and the difference is as follows:

Based on the seniority of the exposures, risk weight of the exposures, the mitigants, and the mitigant value, the order in which the mitigants will be allocated to the exposures is arrived at. The order of allocation can be changed by editing the database function. You have to choose the allocation rank measure in the optimizer definition screen (see below figure) while defining the optimizer logic.



The remaining steps to create optimizer definitions are same as those mentioned in the non-securitization process. The optimizer works on the minimization constraint logic.

#### *Single Mitigant mapped to Single or Multiple Exposures*

If there are one or more than one exposures mapped to a single mitigant, the mitigant is allocated to the exposure with the highest seniority.

If there is more than one exposure with the same highest seniority, then the mitigant is allocated to the exposure which yields the highest mitigant value post haircut.

#### *Single Exposure mapped to Single or Multiple Mitigants*

If there is one or more than one mitigants mapped to a single exposure, the least risk weighted mitigant is allocated to the exposure.

If there are more than one mitigants with the same least risk weight, then the mitigant which has the highest mitigant value post haircut is allocated to the exposure

#### *Multiple Exposures mapped to Multiple Mitigants*

This is treated as a case of a single mitigant mapped to single or multiple exposures to identify a mitigant to be assigned to the exposures. Then, the treatment pertaining to single exposure mapped to multiple mitigants is followed to yield the credit risk weighted exposure amount. Using the above logic, the application calculates the factor of exposure covered by the mitigant and the factor of the exposure uncovered (without any protection).

- **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.

The following sub processes and tasks are handled in the **USA\_NPR\_III\_SEC\_IRB** process:

- Reclassification
- Approach selection
- Pre-CRM EAD Computation
- Risk Weight Assignment – Gross up Approach
- Risk Weight Assignment - Simplified Supervisory Formula Approach
- Risk Weight at 1250%
- Risk Weight Assignment for exception cases
- Pre-CRM RWA Computation
- Mitigant Eligibility
- Mitigant Risk Weight
- Haircut Assignment
- Allocation of Mitigants to Exposures
- Post CRM RWA Computation

### **Risk Weight Assignment OECD member based on CRC Rating**

Under US Regulatory Capital Final Rule, Organization for Economic Co-operation and Development (here on mentioned as OECD) member countries without a CRC rating receives a risk weight of zero, whereas Non- member countries without a CRC rating receive a risk weight of 100 percent.

Bank exposures to sovereign, foreign bank and foreign PSE with a CRC rating continue to be assigned the risk weight that corresponds to the CRC ratings, as proposed in the US Regulatory Capital Final Rule.

### ***Key Data Elements***

A few key data elements are provided in this section. For an entire list of tables and columns to be populated refer to the Download Specifications document. For the treatment indicator as non securitization, those securitization exposures should be excluded from securitization framework.

### **Securitization Exposures:**

If the reporting bank does not have data on the underlying exposures, then the following parameters are expected to be updated in the exposure table:

- Parameters for Gross up Approach are:
  - n\_tranche\_enhanced amount
  - n\_tranche\_percent
  - n\_sec\_exp\_amount
  - n\_sec\_exp\_RW\_UL
- Parameters for SSFA are:

n\_pool\_kg  
 n\_ssfa\_pool\_parameter\_w  
 n\_ssfa\_tranche\_parameter\_a  
 n\_ssfa\_tranche\_parameter\_d

If both the underlying exposure value and direct values are provided by the reporting bank, then the direct values are given preference over the underlying exposure values.

### **Mitigant Eligibility**

#### *Key Data Elements for Mitigants:*

Conforming Residential Mortgages Indicator: The Residential Real Estate mitigants which belong to conforming residential mortgage category should have “Y” value in this field. The application marks them as ineligible mitigants.

Re-securitized exposures mitigants: The mitigants belonging to re-securitized exposures should have “Y” value in this field. The application marks them as ineligible mitigants.

#### *Key Data elements for Exposure Mitigant Mappings:*

Exposure Mitigant Positively Correlated Indicator: If the exposures and mitigants are positively correlated then guarantees and credit derivatives become ineligible

#### *Key Data elements with respect to Ratings:*

The mitigants which are Non Investment Grade become ineligible. The Non Investment Grade mitigants are identified based on the Basel Ratings of the mitigants. The mitigants with ratings less than ‘BBB’ become Non Investment Grade mitigants.

### **Mitigant Risk Weight**

#### *Key Data Elements for Credit Rating:*

Rating Description: The ratings corresponding to ‘EC0’ to ‘EC7’ are used for identifying ‘CRC0’ to ‘CRC7’ classes.

#### *Key Data Elements for Country Dimension:*

Default Indicator: The issuer countries which are defaulted are indicated by this attribute in the country master table.

### **Miscellaneous**

The following data is expected to be provided by the bank:

- Balance of the underlying exposures with various statuses which are required to compute SSFA Parameter W.
- Balance of all the subordinate tranches and their seniority in the cash flow, including tranches where the bank has no exposures is required to compute Parameter A, Credit Enhancement Level, and Eligibility of Nth to Default Credit Derivative Mitigant.
- Balance of any funded credit reserve and its seniority in the cash flow which is required to compute Parameter A, Credit Enhancement Level, Eligibility of Nth to Default Credit Derivative Mitigant.

### **Financial Institutions**

Under the US Regulatory Capital Final Rule, the following are the Financial Institutions mentioned in the rules:

1. Bank holding company
2. Banks
3. Credit union company
4. Depository institution
5. Foreign bank
6. Insurance companies
7. Merchant banking companies
8. Non-banking financial companies
9. Primary dealers
10. Private equity investment firm
11. Savings and loan holding company
12. Industrial loan company
13. Industrial bank
14. State member bank
15. State non-member bank
16. Future commission merchant
17. Swap dealer
18. Financial market utility company
19. Securities holding company
20. SPV (Special Purpose Vehicle)

Under the US Regulatory Capital Final Rules, the agreement stated that, any other company of which bank is having an investment in the equity instruments of the company with an adjusted carrying value of exposure amount equal to or greater than \$10 million, or bank owns more than 10 percent of companies issued and outstanding common shares or similar equity interests and the company is mainly involved in:

- Lending money, securities or other financial instruments, including servicing loans.
- Insuring, guaranteeing, indemnifying against loss, harm, damage, illness, disability, or death, or issuing annuities.
- Underwriting, dealing in, making a market in, or investing as principal in securities or other financial instruments.
- Asset management activities.

The financial institutions rule is defined as - **USA - US III – Non Sec Financial Entity Identification.**

The operational criteria like company that is mainly involved in the financial activity where bank has investment in equity instruments of the company with an adjusted carrying value or exposure amount equal to or greater than \$10 million, or bank owns more than 10 percent of the companies issued and outstanding common shares, falls under the twenty categories of financial institution mentioned above.

Also most of the criteria's fall under the above mentioned twenty criteria's.

Hence, bank can map either a company into one of the twenty criterias or it can customize on their own by adding the counter party in the stg\_party\_master. Ensure to provide the flag against "f\_financial\_entity\_ind" as "Y".

#### **References and Definitions –**

- The term "financial market utility" means any person that manages or operates a multilateral system for the purpose of transferring, clearing, or settling payments, securities, or other financial transactions along with financial institutions or between financial institutions and the person.

*Reference - [http://www.dodd-frank-act.us/Dodd\\_Frank\\_Act\\_Text\\_Section\\_803.html](http://www.dodd-frank-act.us/Dodd_Frank_Act_Text_Section_803.html)*

- An **Industrial Loan Company (ILC)** or Industrial Bank is a financial institution in the United States that lends money, and may be owned by non-financial institutions. Companies that have set up Industrial Banks include **UBS, General Electric, General Motors, American Express, Target Corp, Nordstrom, Harley-Davidson, First Data, UnitedHealth Group, BMW, and Sallie Mae.**

*Reference - [http://en.wikipedia.org/wiki/Industrial\\_loan\\_company](http://en.wikipedia.org/wiki/Industrial_loan_company)*

- An SHC is a nonbank company that owns at least one registered broker or dealer.

*Reference - <http://www.federalreserve.gov/newsevents/press/bcreg/20120530a.htm>*

- **STATE NONMEMBER BANK.**--The term "State nonmember bank" means any State bank which is not a member of the Federal Reserve System.

*Reference - <http://www.fdic.gov/regulations/laws/rules/1000-400.html>*

## **Treatment of RME Risk-Weight**

Under the US Regulatory Capital Final Rules, it assigns either 50 percent or 100 percent risk weight to certain one-to-four family residential pre-sold construction loans and multifamily residential loans under the advanced approaches rule. And it is consistent with provisions of the RTCRRI Act (Resolution Trust Corporation Refinancing, Restructuring, and Improvement Act).

The supplementary information section of the US final rule, that contains comments and discussion, has a mention of assigning RW of 20% to a residential mortgage guaranteed by the federal government through the Federal Housing Administration (FHA) or the Department of Veterans Affairs (VA). However, there is no mention of such treatment in the final text of the rule para 32 (g). The application is following final text and hence, doesn't assign 20% RW to RME guaranteed by FHA or VA.

The RTCRRI Act of 1991 mandates that each agency provide in its capital regulation:

- a) A 50 percent risk weight for one-to four-family residential pre-sold construction loans and multifamily residential loans that meet specific statutory criteria in the RTCRRI Act and underwriting criteria imposed by the agencies.
- b) A 100 percent risk weight for one-to four family residential pre-sold construction loans for residences for which the purchase contract is cancelled.

Therefore according to the RTCRRI Act, Residential Mortgage Exposures receives the following risk-weight:

1. A 50 percent risk-weight to **one-to-four-family residential (residence consisting of 1 to 4 dwelling units) loan** if residences have been pre-sold (that is the home is sold either before or during construction) to buyer and buyer who has made a substantial earnest money deposits. This can be used in defraying cost related to any cancellation of the purchase contract and the loans meet the certain underwriting characteristics such as documentation demonstrating that the buyer of the residence intends to purchase.
2. A 100 percent risk weight for **one-to four-family residential** pre-sold construction loans for a residence for which the purchase contract is cancelled.
3. A 50 percent risk weight for **multifamily residential (consist of more than 4 dwelling unit or an apartment building) loans** that meet the following criteria as per RTCRRI Act –
  - a. If fixed interest rate loan:
    - i. Loan-to-value is not exceed 80 percent.
    - ii. Net operating income to Debt ratio is not less than 120 percent.
  - b. If floating interest loan:
    - i. Loan-to-value is not exceeding 75 percent.
    - ii. Net operating income to Debt ratio is not less than 115 percent.
  - c. Amortization of principal and interest occur over a period of not more than 30 years.
  - d. The minimum maturity for repayment of principal is not less than 7 years that is, loan cannot be foreclosed before 7 years.

If the residential mortgage loan does not meet the relevant criteria according to the above described rule then it is not going to qualify for the statutory risk weights and might be risk-weighted according to the Advanced Approach for US risk-based capital formula.

### **Reference –**

As the requirement specified in the accord, it does not mention the RTCRRI Act and also the criteria under which different risk weight are assigned. All the understanding stated can be referred from the below link-

<http://fraser.stlouisfed.org/download-page/page.pdf?pid=99&id=449705>

## **Loss Given Default Floor for RME**

Under US Regulatory Capital Final Rules, the Loss Given Default (LGD) value for each segment of residential mortgage exposures must not be less than 10 percent. Except for segments of residential mortgage exposures for which all of the principal of each exposure is either:

Directly and unconditionally guaranteed by the full faith and credit of a sovereign entity.

Or

Guaranteed by a contingent obligation of the U.S. government or its agencies.

The requirement for the LGD flooring of 10 percent for the RME exposure class is not applicable if the exposure is guaranteed by sovereign or US government.

This requirement is already handled in the application through the rule – “USA - Non Sec LGD floor Value for Retail Exposures”.

The only change that needs to be included is Party type reclassification is where the US Government has to be mapped to Sovereign as a standard party type reclassification.

## **Cleared Transactions**

The G20 Leaders, at their Pittsburgh summit in September 2009, agreed to a number of measures to improve the over-the-counter (OTC) derivatives markets, including creating incentives for banks to increase their use of Central Counterparties (CCP). Central clearing decreases the possibility of systemic risk by reducing the possibility of transferring financial contagion risk problems from one institution to another institution. This movement of a transaction to a CCP and the eventual failure of CCP can be catastrophic to the entire financial system. The US III, in line with Basel committee guidelines, has introduced a new capital requirement for a bank’s exposure arising from OTC, exchange traded derivatives, and repo style transactions which are cleared through CCP. The application calculates the risk charge for the transaction involving CCP’s as per the guidelines laid out in US III.

This concept is applicable for all the OTC and exchange traded derivatives and SFT products cleared through Qualified Central Counterparty (QCCP). For more information on terms such as Central Counterparty, Qualifying Central Counterparty, Clearing Member, Clearing Member Client, and Bankruptcy Remote refer *Glossary*.

## **Out of Scope**

The concept of Default Fund Requirement of the bank has not been incorporated in the current release of the application.

## **Assumption**

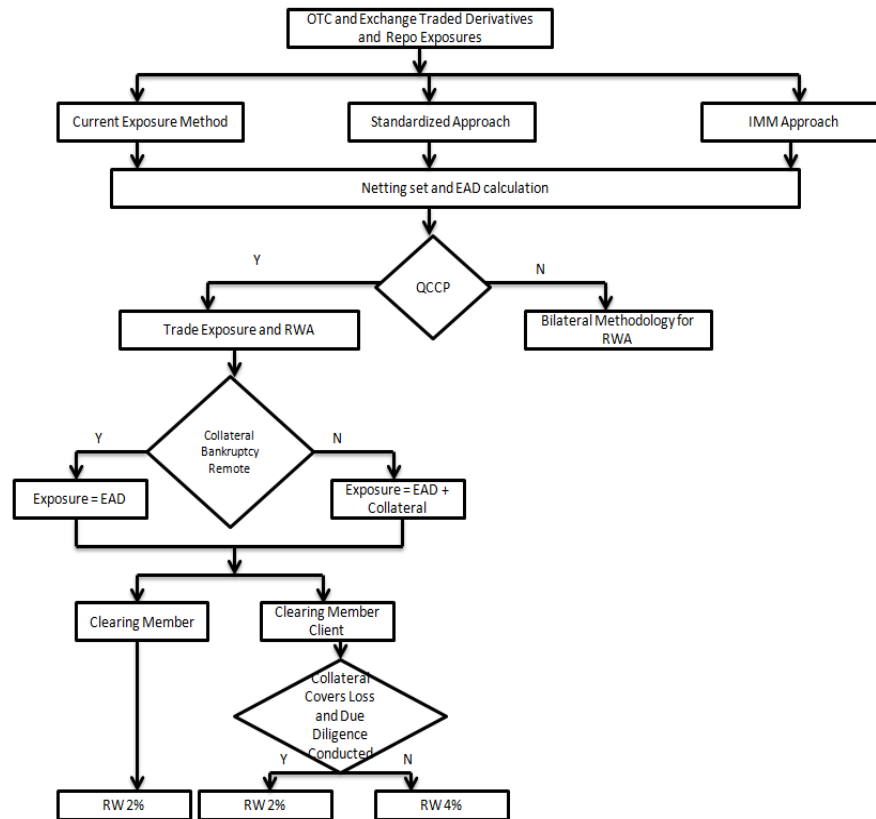
Fair value of collateral will be at counterparty and collateral type level.

## **Interpretation**

- US III does not clearly mention treatment of collateral posted with non qualifying CCP. Therefore, the application currently applies the treatment of bilateral trade for the exposure of bank with non qualifying CCP (NQCCP).
- For the collateral posted with NQCCP, with reference to Reserve Bank of India (RBI) directives, the application currently applies the same risk weight to the collateral posted with NQCCP with transactions of the same nature.
- US III does not state a differential treatment for transactions between clearing member and client, which arises due to the clearing member acting as an intermediary between client and CCP. The application currently does not support any such functionality.



## Process Flow



- **EAD Calculation**

EAD calculation is computed as per Current Exposure Method (CEM) or should be provided as an input for Standardized or IMM approach. The Rule **Non Sec Pre-Mitigation EAD Amount for Cleared Transaction Collaterals** under the EAD Calculation sub process computes this.

- **Treatment of Exposure with Qualified CCP when Reporting Bank act as Clearing Member**

The application expects you to identify all the transactions which fall under the group of cleared transactions. The application calculates risk charge separately for exposures and collaterals posted with the QCCP. All the exposures with the QCCP are assigned a risk weight of 2%. If the collateral posted with the QCCP is not bankruptcy remote, then a risk weight of 2% is assigned. Otherwise a 0% risk weight is assigned.

- **Treatment of Exposure with Qualified CCP when Reporting Bank act as Clearing Member Client**

The application expects you to identify all the transactions which fall under the group of cleared transaction. Risk weight assignment for the exposure with QCCP is based on the validation of the collateral posted by the reporting bank with the clearing member or QCCP. A risk weight of 2% is assigned if the following conditions are met:

If the collateral posted covers all the losses arising for the clearing member or QCCP

Due diligence is conducted on the collateral wherein there will be no restrictions on the clearing member or QCCP for using posted collateral, in case of any legal proceeding at 2%.

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**Note:** These two conditions (that is, collateral covers the loss and due diligence conducted) are expected to be provided as an input.

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If the preceding two conditions are not met, then a risk weight of 4% is assigned. These conditions are collateral specific and the application expects it for the collateral posted with QCCP. It automatically assigns the same to all the exposures of reporting bank with the QCCP. Collateral posted with the QCCP is also assigned the same risk weight which gets assigned to the exposure.

- **Treatment of exposure with non-qualifying CCP when bank acts as clearing member or clearing member client**

The application expects you to identify all the transactions which fall under the group of the cleared transaction. Risk weight assignment for both exposure and collateral posted with the non-qualifying CCP is assigned the same risk weight as that of a bilateral trade. The CCP is considered as bank or corporate for the treatment.

The Risk Weight is assigned by the Rule **Risk Weight Assignment for Cleared Transactions** under the sub process **Risk Weight Assignment** and the Capital Charge for these transactions are calculated by the Rule **Non Sec Pre-Mitigation Capital Charge Calculation for Cleared Transactions** under the sub process **Capital Calculation**.

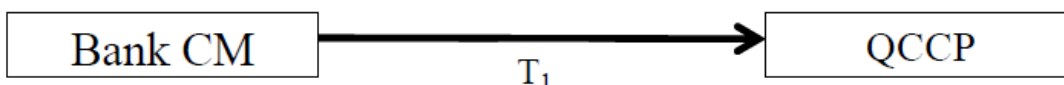
The US Regulatory Capital Final Rules provides that a clearing member banking organization,

- (i) Acts for its own account,
- (ii) Is acting as a financial intermediary (with an offsetting transaction or a guarantee of the client's performance to a QCCP)
- (iii) Guarantees a QCCP's performance to a client

Which is applied to a 2% risk weight to the banking organization's exposure to the QCCP.

Transaction details where reporting bank role is a Clearing member (CM) or a Clearing member client (CMC):

#### Banking Organization Clearing Member (Bank CM) – Own Account

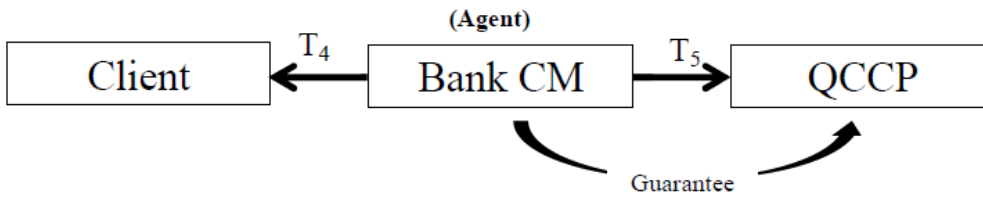


#### Bank CM – Client Trade

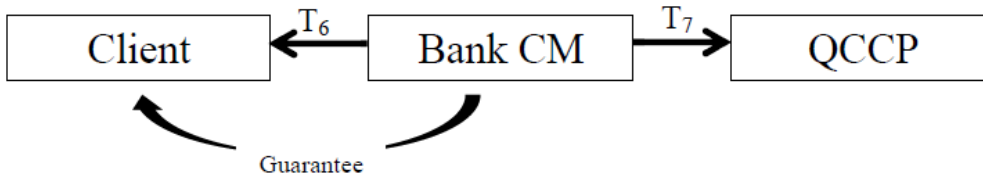
- Financial intermediary with offsetting transaction to QCCP



- Agency with guarantee of client performance



- Guarantee of QCCP performance



Banking organization can play agency role for a direct transaction between CMC and CCP by providing guarantee to CCP on behalf of client or guarantee to client on behalf of CCP.

In case of guarantee to CCP on behalf of client, there is no exposure to CCP but guarantee is an exposure to client. This is treated as OTC exposure to client.

In case of guarantee towards performance of CCP, exposure is taken for both client and CCP as displayed in the following chart detailing for all the transactions.

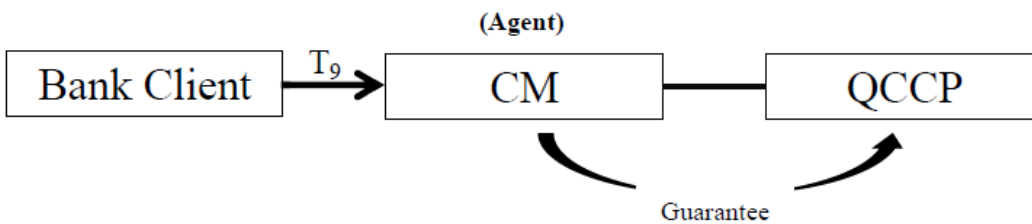
Transaction details where reporting bank role is a Clearing member client (CMC):

### Bank Client – CM Trade

- Financial Intermediary with offsetting transaction to QCCP



- Agency with guarantee of client performance



**Treatment details for Cleared Transaction:**

	<b>Exposure to</b>	<b>Description</b>	<b>Risk-weighting treatment under the US Regulatory Capital Final Rule</b>
T1	QCCP	Own Account	2% risk weight on trade exposure amount
T2	Client	Financial intermediary with offsetting trade to QCCP	OTC derivatives with CEM scalar**
T3	QCCP	Financial intermediary with offsetting trade to QCCP	2% risk weight on trade exposure amount
T4	Client	Agent with guarantee of client performance	OTC derivatives with CEM scalar**
T5	QCCP	Agent with guarantee of client performance	No exposure
T6	Client	Guarantee of QCCP performance	OTC derivatives with CEM scalar**
T7	QCCP	Guarantee of QCCP performance	2% risk weight on trade exposure amount
T8	CM	CM financial intermediary with offsetting trade to QCCP	2% or 4% risk weight on trade exposure amount
T9	QCCP	CM agent with guarantee of client performance	2% or 4% risk weight on trade exposure amount

\*Risk weight varies depending on compliance with bankruptcy remoteness of collateral and probability of client positions.

\*\*Advanced approaches banking organizations using the IMM may reduce the margin period of risk. Under the US Regulatory Capital Final Rules, a clearing member banking organization treats its counterparty credit risk exposure to clients as an OTC derivative contract, irrespective of whether the clearing member banking organization guarantees the transaction or acts as an intermediary between the client and the QCCP. Consistent with the BCBS CCP interim framework, to recognize the shorter close-out period for cleared transactions, under CEM approach a clearing member banking organization may calculate its exposure amount to a client by multiplying the exposure amount, calculated using the CEM, by a scaling factor.

<b>Holding Period (days)</b>	<b>Scaling Factor</b>
5	0.71
6	0.77

7	0.84
7	0.89
9	0.95
10	1.00

### Key Data Elements:

Some key data expectations are as follows:

- For the exposure, the application expects the counterparty for the trades which are stamped as cleared transaction, to be CCP.
- The application also has captured the clearing member code if the role of the bank for the transaction is a clearing member client.
- For the collateral posted with clearing member, the application expects the counterparty to be clearing member and in addition the application also captures the QCCP for which collateral is posted.
- When the collateral is posted with CCP, transactions similar to exposures are expected. Collateral is also expected at counterparty and collateral type level.
- All the collateral records are assigned the risk weight separately.
- The following data elements are expected as an input from the client:

Central Counterparty is Qualifying or Non Qualifying.

Collateral covering losses and due diligence conducted by CMC for the collateral contract.

Bankruptcy Remote status for the collateral posted with CCP.

Fair value of collateral at counterparty and collateral type.

Bank's role in the transaction with the Central Counterparty

### Default Fund Contribution

According to the US Regulatory Capital Final Rule , 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 towards 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.

US Regulatory Capital Final Rules explains the methods that the banking organization playing the part of a clearing member of the CCP, need to adopt and compute risk weighted assets (RWA) for a non-qualifying and a qualifying CCP.

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 the sum of default fund contribution multiplied by 1250%.

If the CCP is a qualified CCP (QCCP), then the RWA amount is computed using one of the following two approaches stated below:

Approaches	Sub – Process
Total Default Fund Contribution Approach	RWA for Default Fund Contribution with QCCP Total Default Fund Contribution Approach
Bank's Own Default Fund Contribution Approach	RWA for Default Fund Contribution with QCCP Banks Own Default Fund Contribution Approach

### 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, we need to know the hypothetical capital requirement of the central counterparty for the default fund. This needs to be computed by the central counterparty based on the exposures of all the clearing members to the default fund. Once 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 QCCP's:

- 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 above step.

These steps and the calculation involved are the following:

#### Step 1:

It requires the QCCP to calculate its hypothetical capital requirement ( $K_{CCP}$ ) for the default fund. This is done by the QCCP and will be published to the clearing members for them to use for their respective capital calculations.

#### Step 2:

Compare  $K_{CCP}$  with the funded portion of the default fund of a QCCP and calculate the capital requirement of the bank ( $K_{CM}$ ) by using the total of all the clearing members' capital requirements ( $K_{CM}^*$ ). This capital

requirement will be considered on the contribution that the clearing members make to the default fund of the QCCP.

## Approach 2:

RWA amount for the default fund contribution is equal to 1250% multiplied by default fund contribution subject to a cap based on banking organization's trade exposure amount for all of its transactions with a QCCP. RWA amount for default fund contributions will be minimum of:

**(1250% \* default fund contribution to the QCCP, 18% \* Trade Exposure Amount to the QCCP).**

### ***Key Data Elements***

Key data elements that need to be noted are listed in this section. To view the complete list of tables used, see the *Download Specification* document.

- Default fund contributions and related data is 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 ( $K_{CM}$ ) 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.

### **Other Amendments**

#### **Eligible Guarantees**

US III has amended the definition of eligible guarantee. An eligible guarantee, as per the proposed rule, now includes a contingent obligation of the U.S. Government or an agency of the U.S. Government, the validity of which is dependent on some affirmative action on the part of the beneficiary or a third party.

Hence, the following list of agencies (if issued a guarantee) is termed as eligible guarantor:

- US Government
- Federal Home Loan Bank
- Federal Agricultural Mortgage Corporation (Farmer Mac)
- Depository institution
- Bank holding company
- Savings and loan holding company
- Credit union
- Foreign Bank
- Securities Firm

Party type reclassification Rule and mitigant eligibility Rule have been modified to incorporate this amendment in the current release.





## Qualified Revolving Exposure

As per US III, unsecured and unconditionally cancellable revolving exposures with a pre-established maximum exposure amount of \$100,000 (such as credit cards) are classified as Qualified Revolving Exposure (QRE). Unsecured, unconditionally cancellable exposures that require payment in full and have no communicated maximum exposure amount (often referred to as charge cards) are instead classified as 'other retail'. Hence, as proposed in US III, charge card qualifies as a QRE, subject to an upper exposure limit of \$100,000. Based on the exposure limit, the revolving exposure is classified into different asset classes. Hence, the reclassification rules have been modified to include charge card which will be reclassified into QRE in the product re-classification to standard product

## Cash Item in Process of Collection

Cash item in process of collection is now risk weighted at 20%. To assign this risk weight a new Rule (**USA - Non Sec RW Assignment for Cash in Process of Collection**) has been introduced in the application.

## Trade-Related Letter of Credit

In US III, trade-related letter of credit exposure's effective maturity must be not less than one day. Hence, the effective maturity floor of 1 year is removed from the application. This change has been brought into effect in the Rule **Non Sec Effective Maturity Assignment for all Exposures**.

## Money Market Fund Approach

Under the Money Market Fund approach, banks were permitted to assign a 7 percent risk weight to exposures to money market funds. These exposures were subject to restrictions under SEC rule 2a-7 and had an applicable external rating in the highest investment grade rating category. US III has proposed to eliminate the money market fund approach. The agencies believe it is appropriate to eliminate the preferential risk weight for money market fund investments due to their experience with them during the recent financial crisis, in which they demonstrated, elevated credit risk at times. Therefore, Money Market Fund rule has been removed in the current release.

## Defaulted Exposures Guaranteed by US Government

Under the US Regulatory Capital Final Rules 2007 for defaulted exposure banking the organization should apply a capital charge of 8% for each wholesale and retail exposures.

Now as per US Regulatory Capital Final Rules , the treatment to defaulted exposure has been made more risk sensitive. Any wholesale or retail defaulted exposures must assign a 1.6 percent capital charge for the portion of exposure that is covered by an eligible guarantee from the US government. For portion that is not covered by an eligible guarantee from the US government continues to be assigned as 8.0 percent capital requirement.

## Eligible Double Default Guarantor

US Regulatory Capital Final Rules has introduced a term called Eligible Double Default Guarantor. The Eligible Double Default Guarantor for a guarantee or credit derivative obtained by a bank are as follows:

- Depository institution
- Bank holding company
- Savings and loan holding company
- Credit union
- Foreign Bank
- Securities Firm
- Non US Based Securities Firm

## Standard Supervisory Haircuts for Repo, Margin Loans and Financial Collateral

Earlier in the US Regulatory Capital Final Rules the volatility haircut for collateral and repo transactions was based on the credit rating of the issuer. However, now as per US Regulatory Capital Final Rule , the volatility haircut for Repo and Collateral is based on the risk weight of the issuer. The risk weight assigned to a different issuer is based on the risk classification or based on the investment grade definition.

### *Risk-Weight Assignment to Sovereign Issuer*

The risk-weight assignment for the sovereign issuer is based on the sovereign's Country Risk Classification (CRC). This is applicable for exposure volatility haircut for repo transactions. The following table details the risk-weight assignment based on the different CRC:

<b>Issuer Type - Sovereign</b>	
<b>CRC</b>	<b>Risk Weight</b>
0	0%
1	0%
2	20%
3	50%
4	100%
5	100%
6	100%
7	150%
No CRC	100%
Sovereign Default	150%

For the following issuers, the risk weight assigned is detailed as follows:

- US Depository Institutions: a direct risk weight of 20% is assigned.
- Credit Unions: a direct risk weight of 20% is assigned.
- For a corporate issuer, a direct risk weight of 100% is assigned.
- Risk-weight assignment for foreign banks and foreign PSEs depends on the bank's native sovereign's CRC. For example, if a foreign bank is giving financial collateral to an entity in US, and the foreign bank's headquarters is in UK, then the CRC of UK is used.

<b>Issuer Type - Foreign Banks</b>	
<b>CRC of entity's home country</b>	<b>Risk Weight</b>
0	20%
1	20%
2	50%
3	100%
4	150%
5	150%
6	150%
7	150%
No CRC	100%
Sovereign Default	150%

For all other issuers a risk weight of 100% is assigned.

### ***Securitization Exposures -Definition of Investment Grade***

Securitization exposures which are of investment grade are applicable as eligible financial collateral. Securitization exposures' investment grade is defined in the following table:

<b>Rating</b>						<b>Rating Type</b>	
<b>Moody's</b>		<b>S&amp;P</b>		<b>Fitch</b>			
<b>LT</b>	<b>ST</b>	<b>LT</b>	<b>ST</b>	<b>LT</b>	<b>ST</b>		
Aaa	P-1	AAA	A-1+	AAA	F1+	Investment Grade	
Aa1		AA+		AA+		Investment Grade	
Aa2		AA		AA		Investment Grade	
Aa3		AA-	A-1+	AA-	F1+	Investment Grade	
A1		A	A+	A-1	A+	F1	Investment Grade
A2			A		A		Investment Grade
A3			A-		A-		Investment Grade
Baa1		P-2	BBB+	A-2	BBB+	F2	Investment Grade
Baa2		P-3	BBB	A-3	BBB	F3	Investment Grade
Baa3	BBB-		BBB-		Investment Grade		

If a bank has two ratings provided by two different rating agencies, where one rating is a Non-Investment Grade and other is Investment Grade, then multiple assessments needs to be performed. Based on this risk weight assignment to different categories of issuers, the Standard Supervisory Volatility Haircut is as follows:

Residual Maturity	Issuer - Sovereign				Issuer - Non-Sovereign			Investment grade securitization exposures
	RW @ 0%	RW @ 20%	RW @ 50%	RW @ 100%	RW @ 20%	RW @ 50%	RW @ 100%	
<= 1 year	0.50 %	1.00%	1.00%	15.00%	1.00%	2.00%	4%	4.00%
> 1 year and <= 5 years	2.00 %	3.00%	3.00%	15.00%	4.00%	6.00%	8%	12.00%
> 5 years	4.00 %	6.00%	6.00%	15.00%	8.00%	12.00%	16%	24.00%
Main Index Equities	N/A	N/A	N/A	N/A	15.00%			
Gold	N/A	N/A	N/A	N/A	15.00%			
Other publicly traded equities	N/A	N/A	N/A	N/A	25.00%			
Mutual Funds	N/A	N/A	N/A	N/A	Highest haircut applicable to any fund (this is currently happening in the solution as equal to 25%)			
Cash Collateral	N/A	N/A	N/A	N/A	0.00%			

The volatility haircut is based on the ten-business day holding period. Sovereign issuers include the foreign PSEs. Foreign PSE that has a 0% risk-weight is allocated the same volatility haircut as that of a sovereign issuer that is being risk weighted at 20%. For counterparty to be reclassified to a 'Foreign PSE' party type reclassification Rules and asset class reclassification Rules have been modified in this current release.

Under Regulatory Capital Rules for Implementation of Basel III in US, compliant with the Proposed rules, the capital calculations remain the same except for the AOCI treatment and the Non qualifying capital instruments treatment. The regulatory capital ratios are calculated as the minimum of the standardized and the advanced capital ratios only for advanced approaches banking organizations that is, advanced banks. This does not apply to standardized approaches banking organizations.

Under Regulatory Capital Rules for Implementation of Basel III in US (compliant with the Basel III Regulations), the Tier 1 capital has become the main constituent of the Capital Structure. The entire Capital Structure of US has undergone changes to be compliant with the Basel III Regulations as well as the Dodd-Frank Act. The total capital requirement of 8% remains the same as in the US Regulatory Capital Rule compliant with Basel II. However, the total capital increases after addition of the capital conservation buffer and countercyclical buffer. The countercyclical capital buffer are applicable only to banks that are subject to the Advanced Approach.

Under Regulatory Capital Rules for Implementation of Basel III in US, Tier 3 is not part of the Capital Structure. Hence, the rule that captures T3 capital component processing in Capital Structure needs to be removed.

Mapping pertaining to T3 capital component are deleted from the bank **Capital Group Components Reclassification**.

Also, the rules present in the Capital Component Calculations sub-process are deleted..

### **Components of Capital**

As per Regulatory Capital Rules for Implementation of Basel III in US, the total capital consists of the sum of the following elements:

- Tier 1 capital
  - Common Equity Tier 1 (CET1)
  - Additional Tier 1 (AT1)
- Tier 2 (T2) Capital

### **Minimum Capital Requirement**

The following are the minimum capital ratios to be maintained by the bank. These values of capital are net of regulatory adjustments and deductions:

- Common Equity Tier 1 must be at least 4.5% of Risk Weight Assets (RWA).
- Tier 1 capital must be at least 6.0% of RWA.
- Total Capital (summation of Tier 1 and Tier 2 capital) must be at least 8.0% of RWA.

The Regulatory Capital Rules for Implementation of Basel III in US does not state any limitations on the T2 capital and hence the application does not have any restrictions in the amount of T2 capital. All the capital instruments which have become non-qualifying due to these regulations will be phased out using the transitional arrangements.

The non-qualifying capital instruments identified are Cumulative Perpetual Preferred Stock and Trust Preferred Securities.

### **Assumptions**

- **Deduction of Non-Significant Investments in the capital of unconsolidated Financial Institutions:**

As per Accord:

- The amount of a banking organization's non-significant investments in the capital of unconsolidated financial institutions that does not exceed 10 percent threshold for non-

significant investments would generally be assigned the applicable risk weight under sections 32 (in the case of non common stock instruments), 52 (in the case of common stock instruments), or 53 (in the case of indirect investments via a mutual fund) of the proposal, as appropriate.

Interpretation in the application:

- Investment below the 10% threshold need to be risk weighted as per Advanced Approach for US of Banking Book products for both banking book and trading book exposures. The trading book exposures are expected to be provided in the Stage Investment (STG\_INVESTMENTS) table.

- **Treatment of REIT Subsidiary in Minority Interest calculation**

As per Accord:

- REIT preferred shares issued by a REIT subsidiary that meets the proposed definition of an operating entity would qualify for inclusion in the regulatory capital of a banking organization. This is subject to the limitations outlined in section 21 of the proposed rule, only if the REIT preferred shares meet the criteria for additional tier 1 or tier 2 capital instruments outlined in section 20 of the proposed rule.

Interpretation in the application:

- REIT is treated as any other banking subsidiary and hence the value of the CET1, AT1 and T2 capital, Capital Ratio for each tier of capital, total RWA, and the percentage of shareholding in each of the component of capital is required for calculating Minority Interest. The third party holding percentage must be 0% for the CET1.

- **Treatment of Investments in Hedge Funds and Private Equity Funds**

As per Accord:

- In the Accord, the investments in Hedge Funds and Private Equity Funds have to be deducted from Tier 1 capital. There is not much clarity on when these investments must be deducted – whether it is along with the other regulatory adjustments or prior to that. Also, it is not clear whether these are investments in the trading book or investments in the capital ownership.

Interpretation in the application:

- These investments in Hedge Funds and Private Equity Funds are deducted in the Tier 1 capital along with the other internal transactions. These investments are the ones where the Reporting Bank has an ownership (that is, the Hedge Funds and Private Equity Funds are the subsidiary of the reporting bank). These investments will generally be outside the regulatory consolidation and hence will be available as data in the Investments (STG\_INVESTMENTS) table.

- **Calculation of Minority Interest**

As per Accord:

- In the Accord, the example detailed for the Minority Interest computation uses the sum of its minimum CET1 capital (4.5%) and the capital conservation buffer (2.5%). However, there is a statement which discusses about the assumption of countercyclical buffer to be at 0% without any details on the usage of countercyclical buffer in the computation.

Interpretation in the application:

- The application uses the sum of Minimum CET1 Capital, Capital Conservation Buffer, Countercyclical Buffer and Additional Loss Absorbency Buffer.

- **AOCI Transition**

As per Accord:

- The AOCI Transition, as per the US Regulatory Capital Final Rule, lists the item “Amount in AOCI attributed to Defined Benefit Post retirement plans”.

Interpretation in the application:

- This is the same as the “Accumulated net gain and loss on defined Pension Fund Obligations”. Hence, the application does not rename the line item, and uses the existing line item of “Accumulated net gain and loss on defined Pension Fund Obligations” in the calculations pertaining to AOCI and AOCI Transition. This amount is expected to be provided as specified by the regulator.

- **Tier 2 Capital**

As per Accord:

- As per the US Regulatory Capital Final Rule, " for Advanced Approach, banking organization includes tier 2 capital, the excess of its eligible credit reserves over its total expected credit loss, provided the amount does not exceed 0.6 percent of its credit risk-weighted assets. Advanced approaches banking organization that is in parallel run includes in tier 2 capital, ALLL limited upto 1.25%. To follow this the you must to add the below following rule in Pre Regulatory Adjustment Capital Calculation process:

- USA - US III - CS - ALL Standard Acct Head to Capital Comp Group Assignment during Parallel Run
- USA - US III - CS - Allowance of Loan and Lease Losses for STD during Parallel Run

Whereas for Standardized Approach Total RWA, the allowance for Loan and Lease Losses (ALLL) is added to the T2 capital up to 1.25%. But in the US Regulatory Capital Final Rule, the portion of ALLL to be added to the T2 capital, the amount of ALLL should exclude the amount of reserves held for residential mortgage loans sold with recourse. And in the total capital ratio, the ALLL added in T2 must be subtracted and instead the Eligible credit reserves which are more than the expected credit loss are added upto a maximum of 0.6% of the credit RWA.

Interpretation in the application:

- But in the solution, since the calculations are specific to the Advanced Approach Bank, the Eligible credit reserves specific to the Advanced Approach are directly added in the Gross T2.

- **Non Qualifying Capital Instruments belonging to AT1 and T2 Capital**

As per Accord:

- The non-qualifying capital instruments identified are Cumulative Perpetual Preferred Stock and Trust Preferred Securities. The Trust Preferred Securities are clearly mentioned to be non-qualifying in both the tier of capital. The Cumulative Perpetual Preferred Stock is non-qualifying in AT1, where as it is not clear whether it is non-qualifying in T2 also.

Interpretation in the application:

- We can interpret that Cumulative Perpetual Preferred Stock is non-qualifying in AT1 but qualifying in T2 capital.

- **Treatment of the Non-Qualifying Capital Instruments**

As per Accord:

- The advanced approach banking organization has a total consolidated assets of \$ 250 billion or more, or will have \$10 billion or more of on-balance sheet foreign exposures, or the bank will have got permission to follow the advanced approach.

Interpretation in the application:

- The depository institution holding companies with less than \$15 billion consolidated assets are not part of the Advanced Approach. Hence it has been assumed that these companies will only be Non-Advanced Approach Banks.
- Also the 2010 Mutual Holding companies are also part of Non-Advanced Approach Banks, and their general asset size is less than \$15 billion.

- **Resecuritization of TRUPS CDOs**

As per Accord:

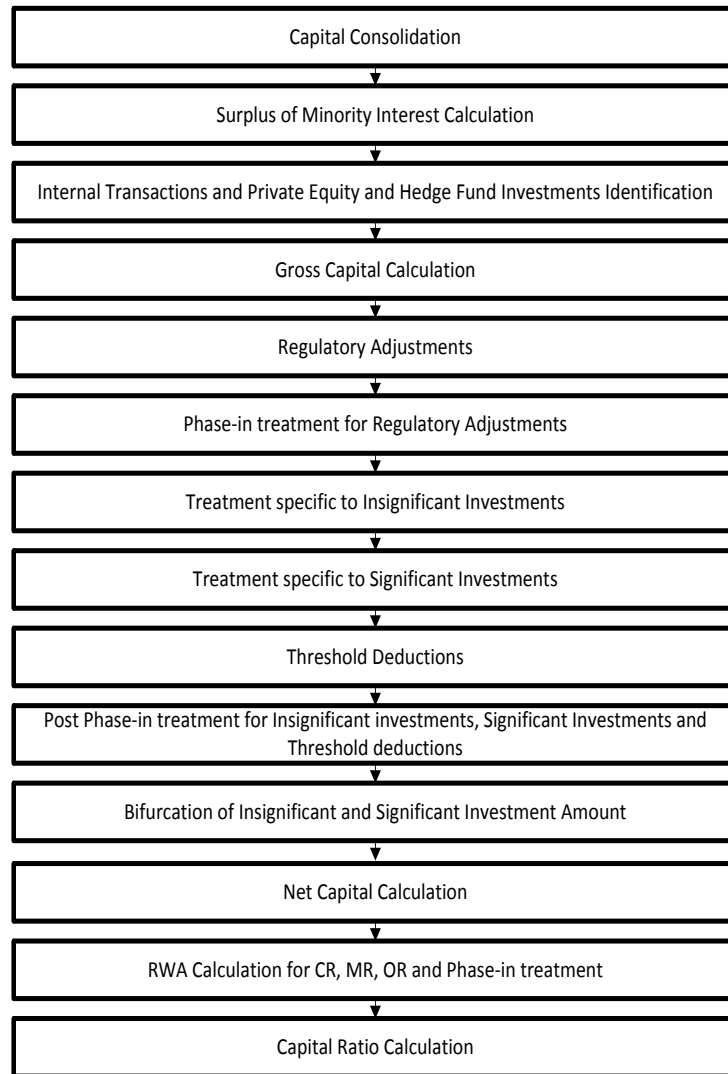
- In the global market, there are very few cases of resecuritization of TRUPS.
- TRUPS are covered bonds, and hence as per the regulation, they can be securitized only once.
- There are no resecuritization cases, wherein the underlying is a TRUPS CDO.

Interpretation in the application:

- We can interpret that we can prorate the amount columns in the final capital calculations, as it currently occurs. This does not affect the resecuritization process.

## **Process Flow**





- **Capital Consolidation:**

To process the capital for a bank, the organization level at which the capital has to be calculated and whether a Solo Run or Consolidation Run should be executed, must be defined. If Solo is selected, then only for that particular selected banking organization the capital is calculated. If consolidation is selected, then all the entities that fall under the umbrella of the selected organization are part of capital calculation. This is done in the task – ‘**Capital Consolidation Level Selection**’ in process ‘**CAPITAL\_CONSOLIDATION**’.

### *Approaches Followed in Capital Consolidation*

The three approaches followed by the Capital Consolidation are:

**Consolidation Approach(CONSL):** Under this approach, all the entities of the bank’s organizational structure are considered. This includes all the entities/subsidiaries that belong to the same jurisdiction. All the exposures of the entities in the organizational structure are considered for computing risk weighted exposures, except the intra-group exposures.

**Aggregation Approach(AGG):** This approach is similar to the Consolidation approach but is used in the cases, where some of the entities that are part of bank’s organizational structure belong to a different jurisdiction. The capital requirement of the affiliate is computed as per the jurisdiction that

it is subject to and is then aggregated with the rest of the group's capital requirement. Intra-group exposures are not excluded in this approach.

**Deduction Approach(DED):** This approach is used in the case where some of the subsidiaries/entities that are part of bank's organizational structure are excluded from consolidation. In such a scenario, the regulatory investment in the excluded subsidiary attributable to the rest of the group are deducted from the consolidated capital requirements.

- **Surplus of Minority Interest Calculation:**

Minority interest (also known as non-controlling interest) refers to the portion of a subsidiary corporation's stock that is not owned by the parent corporation. For example: Company A acquires 80% of the outstanding stock of Company S. Since Company A owns more than 50% of Company S, Company A consolidates Company S's financial results with its own. The 20% of Company S's equity that Company A does not own is recorded on Company A's balance sheet as Minority Interest. Consolidated net income is allocated to the parent and non-controlling interests (minority shareholders) in proportion to their percentages ownership; in this case 80% to Company A and Company 20% to the non-controlling interests.

As per the US III, the REITs is treated for Minority Interest. As per the US Regulatory Capital Final Rules, the REITs are considered for Minority Interest, only if this is an operating entity. This operating entity is an operational criterion and hence this is taken as a download.

As per the US III, the minority interest calculation is calculated based on the total RWA. As per the US Regulatory Capital Final Rules, the minority interest calculation is based on the minimum of the amount in the respective tier, the subsidiary must hold and the Standardized total RWA multiplied by the respective minimum tier percentage. This is interpreted as the comparison between the Standardized Approach total RWA and the Advanced Approach total RWA. This minimum RWA is expected to be provided as an input to the solution.

Surplus of Minority Interest is calculated and the surplus amount in each tier of capital which is attributed to third parties is deducted from the gross capital of each tier of capital.

Minority interest is calculated as the third party's interest (share holding percent) in the surplus capital (available capital – Minimum required capital). This is calculated tier-wise. The available capital is expected from the client tier-wise (CET1, AT1 and T2). The minimum required capital of the CET1, T1 and Total Capital is calculated by multiplying the total RWA by minimum required tier-wise capital as a percentage (Total RWA \* Minimum Required CET1%, Total RWA \* Minimum Required T1%, Total RWA \* Minimum Required Total Capital %). The surplus of the CET1, T1 and Total Capital is calculated as the difference between the available CET1, T1 and Total capital and the minimum required CET1, T1 and Total capital. The surplus of the AT1 capital is calculated as the difference between the Surplus T1 capital and Surplus CET1 capital. The surplus of T2 capital is calculated as the difference between the surplus total capital and the surplus T1 capital. The surplus in each tier attributable to the third party is calculated by multiplying the surplus in each tier by the third party minority holding percentage in each tier.

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 – **Surplus of Minority Interest Calculations** in **USA\_BASELIII\_CAPITAL\_STRUCTURE** process covers the above processing.

- **Internal Transactions, Equity Investment in Financial Subsidiaries and Private Equity and Hedge Fund Investments Identification:**

The private equity funds and hedge funds are identified and the amount of investments in hedge funds and private equity funds are identified and deducted from the Tier 1 Capital. The instruments pertaining to CET1 are deducted from CET1 and the instruments pertaining to AT1 are deducted

from AT1 capital. These deducted items are not processed further under any other process.

As per the US Regulatory Capital Final Rules, the financial subsidiaries are identified and the amount of equity investments (CET1) in these financial subsidiaries are identified and deducted from the CET1 capital.

The deduction also includes internal transactions in each tier of capital among the various entities which are part of the regulatory consolidation. The internal transactions are identified in the Non Securitization process. The internal transactions are identified as any capital related transactions within the organization structure group, which is part of the regulatory consolidation.

These deducted items are not processed further under any other process.

The equity investment in financial subsidiaries, which are in the banking book and trading book provided as download data in the product processor tables, should not be consolidated and will not get processed. The financial subsidiary is identified with the help of the flag "F\_FINANCIAL\_SUBSIDIARY\_INDICATOR" available in the DIM\_ORG\_STRUCTURE table.

- **Gross Capital Calculation:**

For Gross Capital calculation all the components are classified into their respective tiers (CET1, AT1, and T2) based on their purpose. This reclassification is achieved in the **FSI\_STD\_ACCT\_HEAD\_COMP\_GRP\_MAP** table so that reclassification happens at a single instance. 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. In the case of CET1 capital, the application initially calculates the AOCI amount. This AOCI amount is calculated as the sum of the following elements:

- Unrealized gain and loss on Available for sale equity securities (both preferred stock and non-preferred stock). Unrealized gain and loss on Available-for-sale, Debt Securities.
- Unrealized gain and loss on Held-to-maturity, Debt Securities
- Accumulated Net gain or loss on cash flow hedges Accumulated net gains and loss related to Defined Pension Benefit Fund Obligations
- Unrealized gain and loss on Foreign Currency Translation Adjustment

Also, the unrealized gains on AFS Equity Securities that are preferred stock are added to the CET1, as per the transition, by splitting this capital line item into two. These exposures are split in the **FSI\_PHASE\_IN\_TREATMENT** (Phase in Treatment) table into phase-in amount and balance phase-in amount.

The AT1 and T2 instruments include the non-qualifying capital instruments. This is included as per the specified transition percentage present in the **FSI\_SETUP\_CAPITAL\_HEAD** table. This is populated into the **FSI\_PHASE\_IN\_TREATMENT** table and multiplied by the phase-in percentage, to arrive at the phase-in amount, which is part of Gross AT1 or T2.

The sub process – **Provisions and Gross Capital Calculations in USA Basel III Capital Structure** process covers this processing.

- **Regulatory Adjustment:**

Goodwill, DTL associated with goodwill, other intangibles, DTL associated with other intangibles, DTA, DTL associated with DTA, cash flow hedge not fair valued (asset), cash flow hedge reserve not fair valued (liability), gain on sale of securitization transaction, cumulative gain and losses due to change in own credit risk, defined pension fund asset, DTL associated with defined pension fund asset, and defined pension fund liabilities, Mortgage servicing rights and DTL related to Mortgage servicing rights are expected to be direct download values in Stage General Ledger Data (STG\_GL\_DATA) table. The application computes the regulatory adjustment line items which are net of DTL, that is, goodwill net of DTL, other intangibles net of DTL, DTA net of DTL, defined pension fund asset net of

DTL, and net cash flow hedge reserve, and 'Mortgage Servicing Rights net of DTL and Transition AOCI use these in the deduction of regulatory adjustments and in threshold deduction treatment.

Shortfall of stock of provision to expected loss is applicable only for the advanced approaches portfolio. The allowance for loan and lease losses for Advanced Approach for US is obtained by prorating the allowance for loan and lease losses (download in **STG\_GL\_DATA** table) between the percentage of exposures using the standardized approach and the percentage of exposures using the advanced approach. The allowance for loan and lease losses for Advanced Approach for US is the applicable allowance for exposures using the advanced approach.

The sub process – **Provisions and Gross Capital Calculations in USA Basel III Capital Structure** process covers the above processing.

The Investment in own shares are calculated as the sum of the pre-mitigation EAD (**EAD Pre-mitigation Measure Value (N\_EAD\_PRE\_MITIGATION)** in **Fact Non Sec Exposures (FCT\_NON\_SEC\_EXPOSURES)** table) of the exposures which have the flag of treasury stock indicator (**F\_TREASURY\_STOCK\_INDICATOR**) as “Y”.

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 **Fact Non Sec Exposures (FCT\_NON\_SEC\_EXPOSURES)** table) of the exposures which have the flag of reciprocal cross holding indicator (**F\_RECIPROCAL\_CROSS\_HLDG\_IND**) as “Y”.

All the regulatory adjustment line items are deducted from its respective tier of capital post minority and internal transaction deduction.

- **AOCI Opt-Out Calculation**

As per USA Basel III Final rule, the bank that are not subject to the advanced approaches risk-based capital rules (that is, following the Standardized Approach) who have opted for AOCI opt-out election must adjust common equity tier 1 capital elements with the following line items:

- Subtract net unrealized gains and add net unrealized losses on Available-for-sale, Debt Securities
- Subtract net unrealized losses on AFS preferred stock classified as an equity security and net unrealized losses on AFS equity exposures
- Subtract Accumulated net gains and add back any accumulated net losses on cash-flow hedges
- Subtract amounts attributed to defined benefit postretirement plans
- "Subtract any net unrealized gains and add any net unrealized losses on held-to-maturity securities

Also, the banks need to incorporate 45 % of any pre-tax net unrealized gains on AFS preferred stock classified as an equity security and any net unrealized gains on AFS equity exposures in their Tier 2 capital.

The above line items have to be adjusted using the AOCI opt-out option flag.

The banks that have selected opt-out for AOCI calculation must use the above line items to adjust the CET 1. Whereas, the banks that are not subject to the advanced approaches risk-based capital rules but opted not to go for AOCI opt-out must treat AOCI as defined in the Capital Structure of Advanced Approach. In this the bank is allowed to include AOCI in their CET1 and this can be identified through an option provided at the organization level through a flag called AOCI opt-out option flag.

The treatment of pre-tax values of AFS equity securities (This is added to Tier 2 capital with limit of 45%) and AFS preferred stock/non-preferred stock classified as equity (this needs to be part of AOCI) is not currently configured. Refer question 45 under Annexure B: Frequently Asked Questions section. These is required only if organization is on US Basel III standardized approach and elected for AOCI opt-out option. Otherwise, no changes are required.

### **Impact of Solo/ Consolidation**

If going for solo only, AOCI line item pertaining to that bank must be adjusted to CET1. In case if you are going for consolidation parent bank and its associated entity/subsidiary line item must be adjusted against CET1.

Similarly, if going for solo run 45% pre-tax of net unrealized gains on AFS preferred stock classified as an equity security and AFS equity exposures for the bank for which run is executed must be added to Gross Tier2 and if going for consolidation 45% pre-tax of net unrealized gains on AFS preferred stock classified as an equity security and AFS equity exposures of parent bank and its associated entity/subsidiary line item must be added to Gross Tier2.

- **Phase-in Treatment for Regulatory Adjustments:**

The regulatory adjustment line items that include Goodwill net of DTL, Other Intangibles net of DTL, DTA net of DTL, Net Cash Flow Hedge Reserves, Gain on Sale related to Securitization transaction, Defined Pension Fund Asset net of DTL, Transition AOCI Amount Cumulative gains and losses due to changes in own credit risk, Investment in Treasury Stock, and Reciprocal Cross Holding follows phase-in arrangement as per the timelines mentioned by the US Basel III Accord. The phase-in deduction percent for each year is available in a setup table - **Setup Capital Heads (FSI\_SETUP\_CAPITAL\_HEAD) table.**

- **Treatment specific to Insignificant Investments**

Investment in all financial entities, which are outside the scope of regulatory consolidation, will be identified for significant and insignificant investments.

The shareholding percent for these parties are expected as download in STG\_PARTY\_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. 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 USA\_US\_III\_CAPITAL\_CONSOLIDATION 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 **Fact Non Sec Exposures (FCT\_NON\_SEC\_EXPOSURES)** table. 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 have 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 the N\_EAD\_PRE\_MITIGATION is considered. 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: **F\_SIGNIFICANT\_INVESTMENT\_IND** in Fact Party Shareholding Percent ( FCT\_PARTY\_SHR\_HLD\_PCT) with value N.

The exposure amount of banking book and trading book 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 Regulatory Consolidation Processing in USA Basel III Capital Structure** process covers the above processing.

After the application of this treatment, the Insignificant Investments line item will also follow phase –in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

- **Treatment specific to Significant Investments**

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 Entity Information (FCT\_ENTITY\_INFO)** with value ‘Y’.

The exposure amount of banking book and trading book 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 Regulatory Consolidation Processing in USA Basel III Capital Structure** process covers the above processing.

After the application of this treatment, the Significant Investments line item will also follow phase –in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

**Treatment of Synthetic and Indirect Investments:**

In the case of Indirect Investments, the solution provides an option to either follow the Simple Calculation else apply the Insignificant Investment treatment. The solution captures the fund investment percentage in the Capital instrument (Fund Capital Instrument Investment Limit), in the Stage Fund Equity Investments table (STG\_FUND\_EQUITY\_INVESTMENTS). The solution subtracts the Carrying value of the capital instrument from CET1, along with Insignificant Investment calculation, in case of the Simple Calculation.

The solution processes these investments as per the treatment for exposures pertaining to Insignificant and Significant Investment, if the option of Insignificant Investment treatment is selected. And the deduction, as applicable per phase-in, will be from CET1.

**Threshold Deduction**

The three line items, (Significant Investment in the Common Shares of Accounting entities from the **FSI\_NON\_REG\_CONSL\_ENTITY\_INVST**, Mortgage Servicing Rights net of DTL from the **FCT\_STANDARD\_ACCT\_HEAD** table, and DTAs that arises from temporary differences that

comes from the **FCT\_CAPITAL\_ACCT\_HEAD**) are populated in the **FSI\_THRESHOLD\_TREATMENT** table and the threshold calculations are processed in this table.

### **Threshold Treatment**

These three line items are individually compared with the 10% of CET1 calculated post Regulatory Adjustments, Insignificant Investments and Indirect Investments. 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, will go for risk weighting at 100%. During the transition period, the check of 15% is against the CET1 post all regulatory adjustments and adjustments to insignificant investments and significant investments. 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 will be risk weighted 100% during the transition period and will be risk weighted 250% post the transition period.

The same phase-in treatment is followed by the aggregate 15% limit for Significant Investment in the Common Shares of Accounting entities, Mortgage Servicing Rights, and DTAs that arises from temporary differences.

If the amount of Mortgage Servicing Assets (MSA) deducted after the application of the threshold is less than 10% of the fair value of the MSAs, then there is an additional deduction of MSA. The additional amount of MSAs must be deducted from CET1 so that the deducted MSA is at least 10% of the fair value of the MSA. For example: assume that in the year 2013 the fair value of MSA is 20 and after applying the threshold deduction percentage (which is 0%), the amount to be deducted is 0. Then, the minimum amount of deduction of MSA is 10% of the fair value of MSA which is 2. Hence, 2 have to be deducted from MSA due to this provision.

The sub process – **Threshold Treatment Calculations** in **USA Basel III Capital Structure** process covers the above processing.

- **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 – **Threshold Treatment Calculations** in **USA Basel III Capital Structure** process covers the above processing.

- **Bifurcation of Insignificant and Significant Investment amount:**

All the investment transactions in Insignificant Entity and Significant Entity go for bifurcation. Insignificant investment amount below 10% are stamped as 'INSIG\_RWA' and any amount above 10% are stamped as 'INSIG\_DED'. The same logic is applied to Significant Investment amount in CET1. The CET1 amount in Significant Investment entity that is below 10% and 15% limit is stamped as 'SIG\_RWA' and amount above 15% limit is stamped as 'SIG\_DED'. The original transactions are deleted and new transactions are created with stamping as described above. The new transaction thus created can be traced by looking into the parent exposure id.

The exposure to be deducted is marked with standard account head surrogate key based on whether the deduction is Insignificant or Significant investment and based on capital component group.

This splitting of exposures is done in Fact Non Sec Exposures (**FCT\_NON\_SEC\_EXPOSURES**) and Fact Sec Exposures (**FCT\_SEC\_EXPOSURES**). This splitting logic is carried to **Equity Exposures (FCT\_EQUITY\_EXPOSURES)** and **Fact Sub Exposures (FCT\_SUB\_EXPOSURES)** as well.

The entire processing is done in the sub processes –

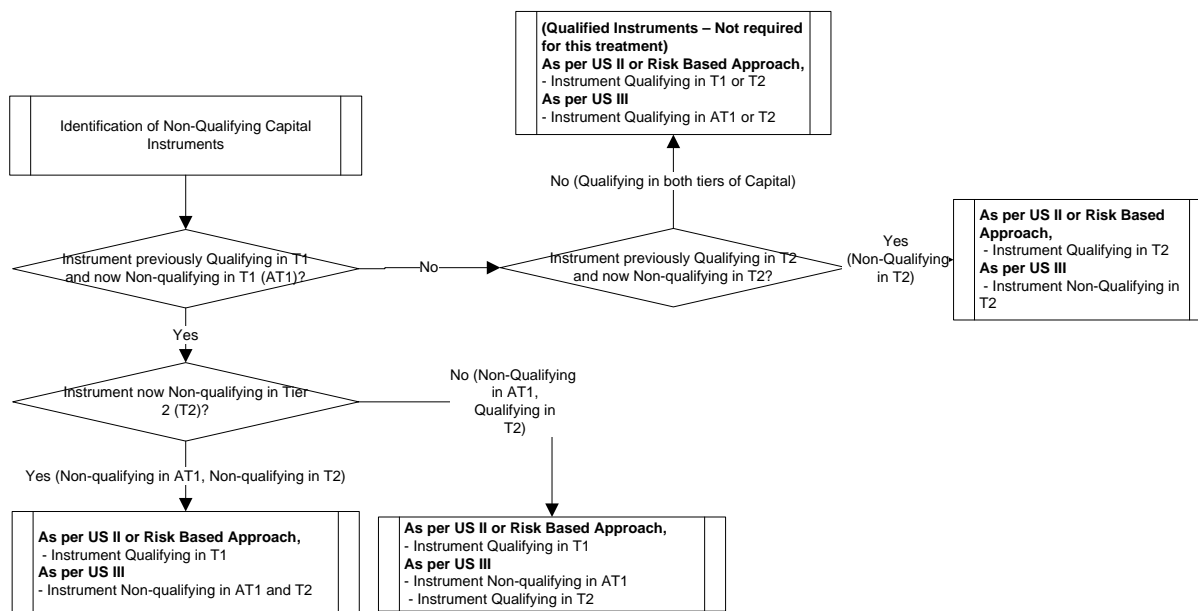
- **Sec Insignificant Investment Exposure Processing,**
- **Non Sec Insignificant Investment Exposure Processing,**
- **Non Sec Significant Investment Exposure Processing,**
- **Non Regulatory Investment Sub Exposures Population,**
- **Non Regulatory Investment Nettable Pool Population, and**
- **Equity Non Regulatory Investment Processing in the process – USA Basel III Capital Structure.**

### Non-Qualifying Capital Instruments

The non-qualifying capital instruments are instruments which were qualifying as per US Basel II Guidelines or by US General Risk Based Guidelines, and currently do not meet the eligibility criteria for qualification in the respective tiers of capital. These instruments are expected to be issued prior to May 19, 2010. The Non-qualifying data in PP must be provided prior to the issue date.

These non-qualifying instruments belong to any of the following criteria (at a broad level), for any bank:

- Instruments which were previously qualifying in T1 Capital, but now non-qualifying in AT1 Capital. These instruments can satisfy any of the following criteria:
  - Currently qualifying in T2 Capital
  - Currently non-qualifying in T2 Capital
- Instruments which were previously qualifying in T2 Capital, but now non-qualifying in T2 Capital



The treatment for the identified non-qualifying capital instruments depends on the bank type. The applicable bank types are as follows:

- Depository Institution Holding Company



- 2010 Mutual Holding Company
- Depository Institutions

In the case of banks which are adopting advanced approaches, the transition percentages are applicable starting from the year 2014. In the case of banks which are adopting of non-advanced approach, the transition percentages start from the year 2015.

### Identification of the Non-Qualifying Capital Instruments

The non-qualifying capital instruments are identified with the help of a flag. The non-qualifying instruments have to be identified as to which is the core group from which they are non-qualified. Also, they have to be identified as to which is the group to which they are non-qualifying. Hence, they have to be identified and they belong to one of the following:

- Qualified as per existing treatment under Tier 1, but currently non-qualifying in AT1 and T2
- Qualified as per existing treatment under Tier 1, but currently non-qualifying in AT1 but Qualifying in T2
- Qualified as per existing treatment under Tier 2, but currently non-qualifying in T2

Also, the accord specifies the treatment for non-qualifying capital instruments at an aggregate level across each tier and not individually. Hence the solution must aggregate these instruments and use it for further calculation.

Also, there is an operational requirement for the non-qualifying instruments to be issued prior to May 19, 2010. This is a data expectancy from the client to validate and provide the data only for those non-qualifying instruments which satisfies this criteria.

The following are the instruments which are identified as non-qualifying:

- **TRUPS**
- **CPPS**

### Identification of the treatment specific to the Non-Qualifying Capital Instruments

The treatment of the Non-qualifying capital instruments depends if the bank belongs to any of the following criteria:

- Depository Institution Holding Company with consolidated group assets more than \$15 billion
- Depository Institution Holding Company with consolidated group assets less than \$15 billion or Mutual Holding Companies as of 2010
- Depository Institutions

The identification of the parent entity type is essential for the identification of the treatment to apply to the bank. The identification of the entity type are as follows:

- **Depository Institution Holding Company:**  
In this case, the reporting bank is the ultimate parent. This is identified with the help of the ultimate parent flag.
- **2010 MHCs:**  
This has to be identified as institutions which were MHCs before May 19, 2010. Since it is an operational criterion, this has to be identified with the help of a flag.
- **Depository Institutions:**  
In this case, the reporting bank is not an ultimate parent and is also not a 2010 MHC.

The identification of the entities for the treatment can be summarized as follows:

Reporting Bank	Ultimate Parent Flag	Mutual Holding Companies Flag	Group Consolidated Assets	Treatment Identification for Non-Qualifying Capital Instruments
Reporting Bank	Y	N or Null	>= \$15 billion	Depository Institution Holding Company with consolidated group assets more than \$15 billion
Reporting Bank	Y	N or Null	< \$15 billion	Depository Institution Holding Company with consolidated group assets less than \$15 billion or Mutual Holding Companies as of 2010
Reporting Bank	Y	Y	Any	Depository Institution Holding Company with consolidated group assets less than \$15 billion or Mutual Holding Companies as of 2010
Reporting Bank	N	Y	Any	Depository Institution Holding Company with consolidated group assets less than \$15 billion or Mutual Holding Companies as of 2010
Reporting Bank	N	N or Null	Any	Depository Institutions

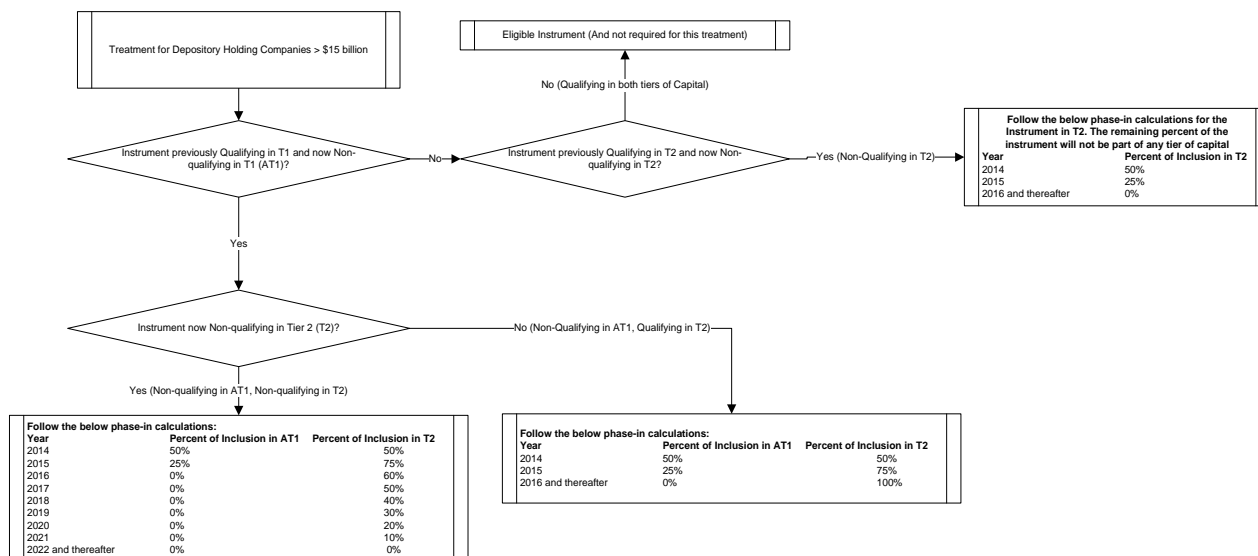
#### Treatment specific for Advanced Approaches Bank

The Advanced Approaches Bank are banks which satisfy any of the following three criteria:

- They have a consolidated group asset size of more than or equal to \$250 billion.
- They have a consolidated group on-balance sheet foreign exposures of more than or equal to \$10 billion.
- They have obtained the permission from the regulator to calculate RWAs using the Advanced Approach.

Depending upon the identification of the parent entity, the treatment for the non-qualifying capital instruments are as follows:

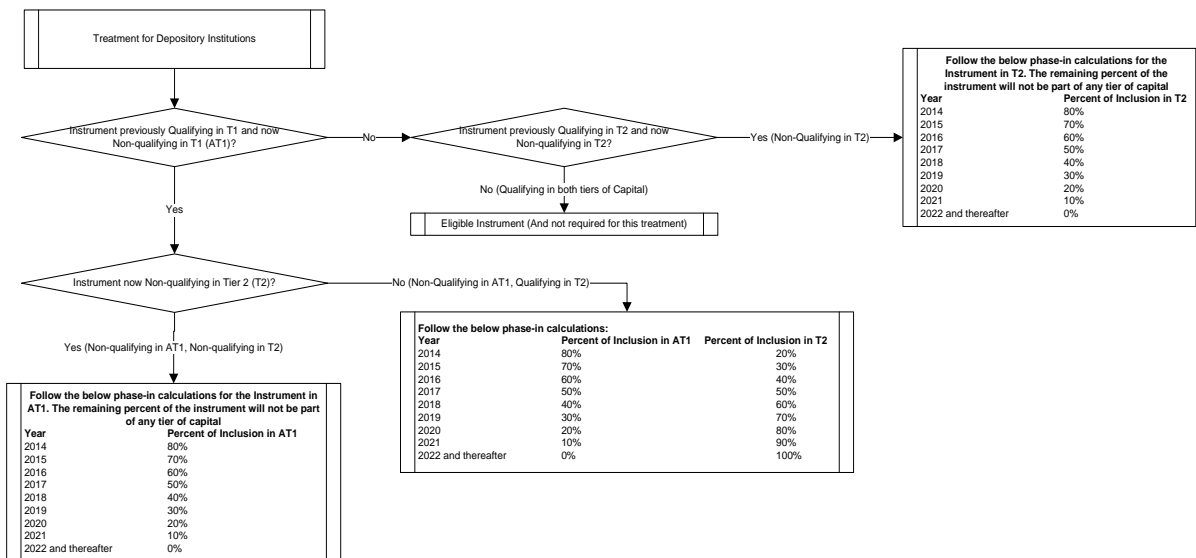
### 1. Depository Institution Holding Company with consolidated group assets more than \$15 billion



### 2. Depository Institution Holding Company with consolidated group assets less than \$15 billion or Mutual Holding Companies as of 2010

This is not applicable for the Advanced Approaches Bank, since they have the consolidated assets of \$250 billion or more.

### 3. Depository Institutions

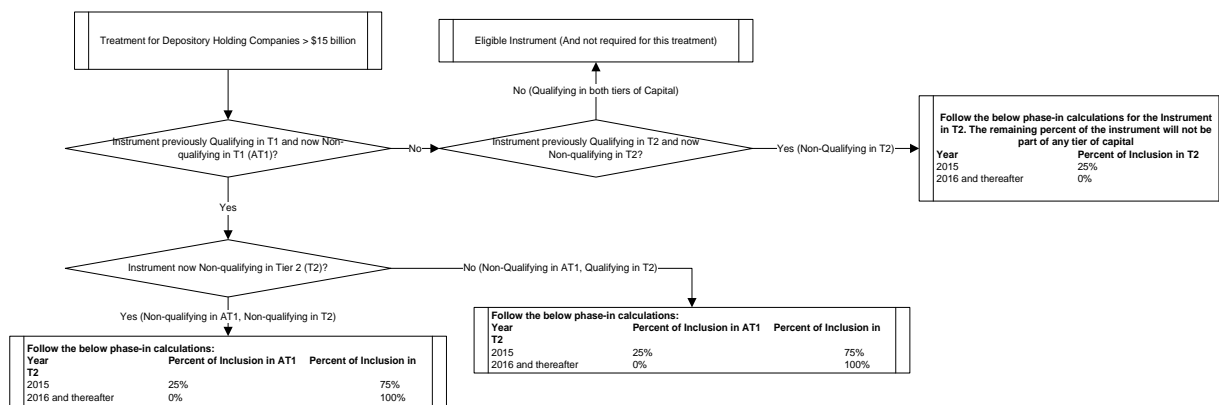


### Treatment specific for Non-Advanced Approaches Bank

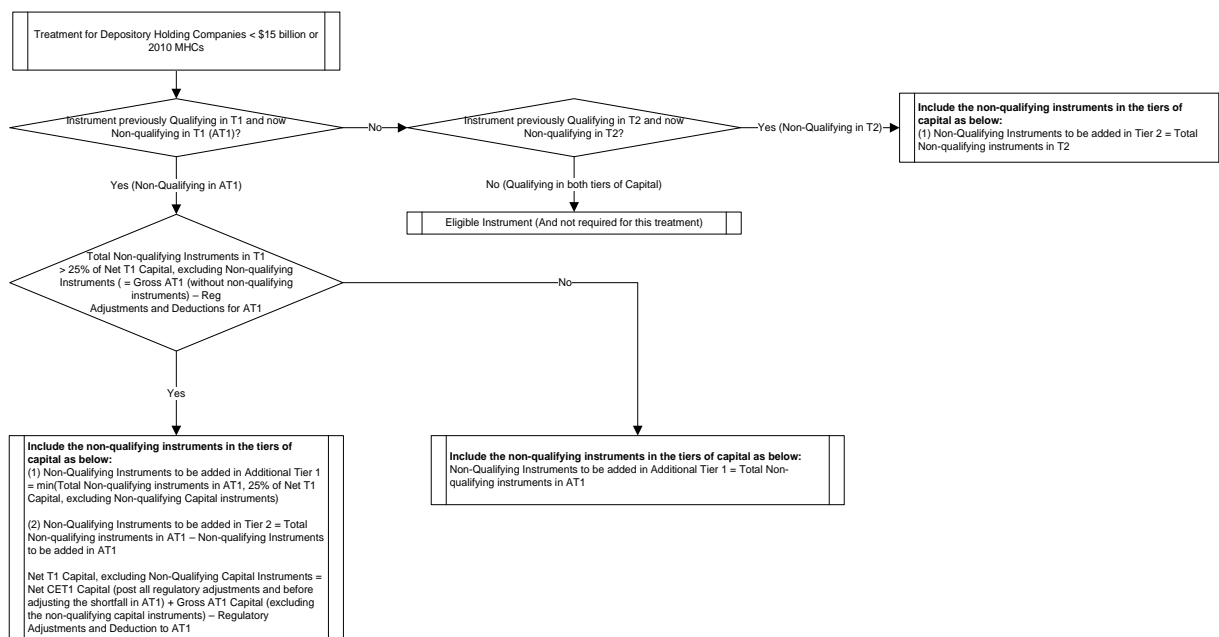
This is the detailing of the treatment specific for Non-Advanced Approaches Bank. In the case of Non-Advanced Approaches Bank, the transition is applicable only from the year 2015. Apart from that, the other difference is that the treatment specific to Depository Institution Holding Companies with less than \$15 billion consolidated assets or the 2010 MHCs is applicable only for the Non-Advanced Approaches Bank.

Depending upon the identification of the parent entity, the treatment for the non-qualifying capital instruments is as follows:

#### 4. Depository Institution Holding Company with consolidated group assets more than \$15 billion



#### 5. Depository Institution Holding Company with consolidated group assets less than \$15 billion or Mutual Holding Companies as of 2010



This treatment is different from the other two entity types. In this, the application calculates the Net T1 Capital considering post all adjustments, excluding the Non-qualifying instruments. The total non-qualifying capital instruments is included in the AT1 which are non-qualifying in T2, are based on the Net T1 Capital.

- **Total Non-qualifying capital instruments, which were previously qualifying in T1** = Total Non-qualifying capital instruments, which were previously qualifying in T1, but currently Non-qualifying in AT1 and T2 + Total Non-qualifying capital instruments, which were previously qualifying in T1, but currently Non-qualifying in AT1 and qualifying in T2.
- **Total Non-qualifying capital instruments, which were previously qualifying in T2** = Total Non-qualifying capital instruments, which were previously qualifying in T2, but currently Non-qualifying in T2.
- **Total Non-qualifying capital instruments, which were previously qualifying in T1**  
The amount of Non-qualifying capital instruments, which were previously qualifying in T1 is based

on the Net T1 Capital.

The calculations are as follows:

Net T1 Capital =

Net CET1 capital post Insignificant Investments and Indirect Exposures – Significant Investment amount above individual threshold amount post phase-in – DTA related to temporary differences above individual threshold post phase-in – MSA net of DTL above individual threshold post phase-in – Aggregate threshold phase-in Deduction Amount + Gross AT1, excluding non-qualified instruments – Regulatory Adjustments related to AT1

**Regulatory Adjustments related to AT1 =**

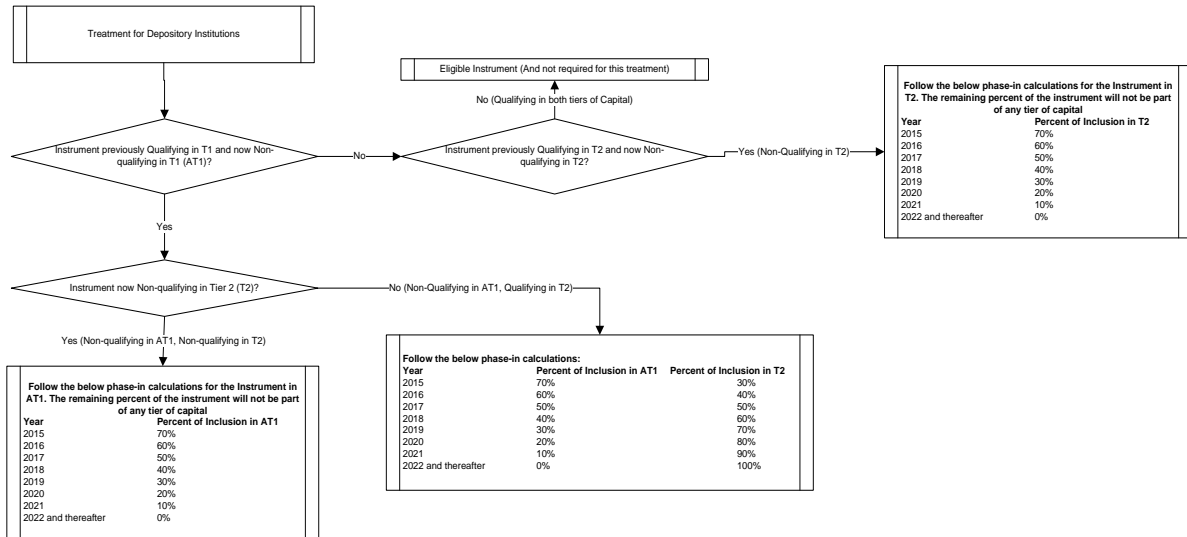
Balance Phase-in applicable Regulatory Adjustments from CET1 + Investments in Own shares in AT1 + Reciprocal Cross Holdings in AT1 + Insignificant Investments related to AT1 + Indirect Exposures related to AT1 + Significant Investments related to AT1

Total Non-Qualifying Instruments of AT1 is based on 25% of Net T1 Capital. If the total is less than or equal to 25% of Net T1 Capital, then, the total non-qualifying instruments of AT1 are added to the AT1 Capital.

If the total is more than 25% of Net T1 Capital, then, minimum of 25% of Net T1 Capital and the total non-qualifying instruments in AT1 are added to the AT1 capital. The remaining is added to the T2 Capital.

- Total Non-qualifying capital instruments, which were previously qualifying in T2**  
 The amount of Non-qualifying capital instruments, which were previously qualifying in T2 is added to the T2 Capital. There is no cap on the amount added to the T2 Capital.

**1. Depository Institutions**



**Net Capital Calculation**

The Net CET1, Net AT1, and Net T2 capital amount are calculated post all regulatory adjustments, including the insignificant, significant, and threshold treatment. 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** in process **USA Basel III Capital Structure**.

### **RWA Calculation for Credit Risk, Market Risk, Operational Risk and Phase –in arrangement**

The following data is collated and RWA is computed:

- Non-securitized exposures data and the associated mitigants data to compute as Risk Weighted Asset amount for Advanced Approach for US portfolio.
- CVA Exposures Data to compute CVA RWA
- Securitized exposures data and the associated mitigants data to compute **Sec RWA**

The **Market Risk RWA** for Market Risk and **Operational RWA** for Operational Risk are expected as a download. The Regulatory Adjustment RWA is the sum of RWA calculated for all the exposures which undergo the processing of Regulatory Deductions, Insignificant Investments, Significant Investments, and the Threshold deduction line items which are risk weighted.

The Total RWA amount is the summation of Non Securitization, Securitization, Market Risk, Operational Risk, and Regulatory Adjustment RWA.

The above processing is done in sub process – **RWA Populations** in process – **USA Basel III Capital Structure Capital Ratio**.

The DTAs arising due to the temporary difference has to be at a risk weight of 100% and once the RWA is calculated as a part of Credit RWA.

#### **Net Long Position and Total RWA**

The investment in own shares, insignificant and significant investments considers the direct, indirect and synthetic investments. The direct investments are the capital instruments which are directly held by the bank. The indirect investments are the capital instruments which are held by the bank through an investment fund that is, the bank invests in investment fund, and the investment fund has invested in a capital instrument. The synthetic capital instruments are the capital instruments on which the bank has a synthetic transaction in the form of guarantees, credit derivatives or options.

For all these transactions, the capital considered is the net long position, which is the gross long position net of any qualified short position in the same exposure. You need to provide value (“Y” or “N”) against the flag “F\_CAPITAL\_NETTING\_QUALIFICATION\_FLAG” whether the gross long position is allowed to be deducted from the net of short positions in the same underlying instrument. This is done only if the short positions involve no counterparty risk and both long and short position have same maturity.

The total RWA must be the sum of the RWA of all the exposures, for which the bank has an exposure, summed up based on the risk types. It is the sum of the following:

- Total RWA for Credit Risk Exposures, calculated using the Standardized Approach. This includes the following:
  - Total RWA for Credit Risk Exposures, apart from the ones listed below, calculated using the Standardized Approach
  - Total RWA for Cleared Transactions, and Default Fund Contributions, calculated using the Standardized Approach
  - Total RWA for Unsettled Transactions, calculated using the Standardized Approach
  - Total RWA for Securitization Exposures, calculated using the Standardized Approach
  - Total RWA for Equity Exposures, calculated using the Standardized Approach
  - Total CVA RWA, calculated using the same approach as applicable in the Advanced Approach (this is applicable only in the case of Advanced Approach Banks for comparison purpose)

- Total RWA for Market Risk Exposures, calculated using the Standardized Approach
- Total RWA for Operational Risk (this is applicable only in the case of Advanced Approach Banks for comparison purpose)

And the following will be subtracted from this summation to arrive at the Total RWA applicable for Standardized Approach

- Amount of ALLL that is not included in tier 2 capital and
- Amount of allocated transfer risk reserves

## **Capital Ratio Calculation**

CET1 ratio, T1 ratio, T2 ratio, and Capital Adequacy ratio are calculated using the Total RWA amount and Net CET1 Capital, Net T1 Capital, Net T2 capital and Total Capital (sum of Net T1 Capital amount and Net T2 capital amount) amount.

Starting from the year 2015, the solution calculates the ratios as minimum of Standardized approach Ratios and Advanced Approach Ratios. The standardized approach ratios are expected as download values in the stage standard accounting head table (STG\_STANDARD\_ACCT\_HEAD).

For the year 2014, the solution calculates the Total Ratios as the Advanced Approach Ratios.

This is done in sub process – **Capital Ratio Calculations** in process in **USA Basel III Capital Structure Capital Ratio**.

## **Key Data Elements**

The key data elements are listed in this section. For more information on the tables and columns to be updated, see the *Download Specifications* document.

- The data for third party investment, with the investment percentage in each tier of capital along with the total amount available in each tier of capital is expected as a download value, for the surplus of Minority Interest computation.
- The entity level Market Risk RWA is expected as a download value in the Standard Account (**DIM\_STANDARD\_ACCT\_HEAD**) table. This is required for calculating the Total RWA.
- The Market Risk data for significant and insignificant investment exposures is expected as download value in the investments (**STG\_INVESTMENTS**) table (for equity and non-equity trading book exposures except the mutual fund trading book exposures) along with the other investment data. This data is also expected in the Fund Equity Investments (**STG\_FUND\_EQUITY\_INVESTMENTS**) table (for mutual fund investments in the trading book) along with other mutual fund investment data.
- The data for indirect capital instruments are expected in the Fund Equity Investments table (**STG\_FUND\_EQUITY\_INVESTMENTS**) and the underlying of these investments are expected in the Equity Exposures table (**STG\_EQUITY\_EXPOSURES**). The synthetic capital instruments are expected in the Credit derivatives (**STG\_CREDIT\_DERIVATIVES**), guarantee (**STG\_GUARANTEES**), Option Contracts (**STG\_OPTION\_CONTRACTS**), Futures (**STG\_FUTURES**) and Swap Contracts (**STG\_SWAP\_CONTRACTS**). The underlying information for these exposures are expected in the Underlying Exposures table (**STG\_UNDERLYING\_EXPOSURES**).
- The synthetic capital investment pertaining to the securitization framework are expected in the Sec Exposures table (**STG\_SEC\_EXPOSURES**) and the underlying of the exposures available in either Investments table (**STG\_INVESTMENTS**) or else in Underlying exposures' table (**STG\_UNDERLYING\_EXPOSURES**).
- The short position amount to be netted against a long position is expected as a download.
- The flag to identify whether the netting is applicable is expected as 'Y' to calculate the net long position amount.
- The Operational Risk RWA is expected as a download value in the Standard Account (**DIM\_STANDARD\_ACCT\_HEAD**) table. This is required for calculating the total RWA.
- All the amounts are converted into the same currency for ease of processing and reporting.
- The application expects the GL IDs and the description to be unique across an entity and the data is expected at a solo level. The application ignores consolidated data and calculates the data for consolidation.



- ESOP common shares, which are included in Paid up common shares have a value of 0 or greater than 0. This cannot be a negative number. This will be a component of Gross CET1 and will be included in the Paid up common shares.
- ESOP debt Other capital instruments, which are included in other AT1 capital instruments have a value of 0 or greater than 0. This cannot be a negative number. This will be a component of Gross AT1 and included in other AT1 capital instruments.
- AOCI Amount Data Expectation

The Accumulated Other Comprehensive Income (AOCI) is expected as individual various components. This data expectation is uniform for all the values across the organization structure of the parent entity.

The individual components, which constitute the AOCI Transition Amount, are summed up and will undergo transitional arrangements.

The total AOCI amount is provided as a download line item, the Transition AOCI is expected as a download.

There are unrealized gain and loss on Held-to-maturity, Debt Securities. This can be either positive or negative number and it is a component of AOCI element. This is expected to be an amount net of any associated deferred tax component (DTA/ DTL).

There are unrealized gain and loss on Foreign Currency Translation Adjustment. This can be either positive or negative number and it is a component of AOCI element. This is expected to be an amount net of any associated deferred tax component (DTA/ DTL).

There is unrealized gain on Available-for-sale Equity Securities that are not preferred stock classified as an equity security under GAAP or equity exposures. This can be either positive or negative number and it is a component of AOCI element. This is expected to be an amount net of any associated deferred tax component (DTA/ DTL).

There is unrealized gain on Available-for-sale Equity Securities that are preferred stock classified as an equity security. This can be either positive or negative number. A portion of this is a component of AOCI element (as per the transition percentage) and the remaining is a component of Gross T2. This is expected to be an amount net of any associated deferred tax component (DTA/ DTL).

There are accumulated Net Gain (Loss) on Cash Flow Hedges that are realized in the balance sheet on fair value. This can be either positive or negative number and it is a component of AOCI element. This is expected to be an amount net of any associated deferred tax component (DTA/ DTL).

The unrealized gain and loss on Defined Pension Fund Obligations is expected to be provided as an input after excluding (at the Bank's option) the portion related to defined pension fund assets which are deducted according to the applicable regulatory deductions.

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**Note:** - All the line items related to AOCI calculation (Except the line items related to Net Cashflow hedge Reserve) are expected to be provided as a download net of any associated deferred tax component.

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- If the AOCI is provided a download line item, then the Transition AOCI is also expected as a download. Else, this will be a calculated line item)
- Minority Interest Calculations' Data Expectation

The application expects the capital ratios, tier wise capital amount, third party investment percentage, and the total RWA of the subsidiary as download for the Minority Interest calculation.

The entities which have to be processed for Minority interest computation have to be provided with the F\_THIRDPARTY\_MINORITY\_HOLD\_IND flag in the STG\_ENTITY\_SHR\_HLD\_PERCENT table as "Y".

The application expects only the preferred shares data for the REIT subsidiary. Hence for the Minority Interest computation to happen correctly, the REIT subsidiaries should enter the CET1, AT1, T2 and Total

RWA amount. The stage data expectation for minority interest calculation in REIT is the third party holding percentage must be 0% for the CET1, and must have the applicable percentage only for the portion of preferred shares data in the REIT subsidiary.

The application processes the REIT subsidiaries available as part of the DIM\_ORG\_STRUCTURE table, wherein the operating entity flag is "Y", regardless of the third party minority holding indicator flag as "Y" or "N". The REIT subsidiaries should have the regulatory entity indicator flag as "Y" in the DIM\_ORG\_STRUCTURE table.

- Regulatory Adjustments' Data Expectation

The application expects the goodwill value to be provided, which is net of the goodwill for the entity as well as any goodwill used in the valuation of the significant investments

The application expects the deferred tax liabilities value associated with the various regulatory adjustments to be populated wherever the entity expects the value to be netted, satisfying the criteria for netting

The application expects the 'Other Intangible Assets' as a single line item, which includes all the intangible assets other than goodwill.

The defined pension fund net asset is not required to be deducted for insured depository institution. Since the insured depository institutions will not be part of regulatory consolidation, this data is not expected for those institutions in the STG\_GL\_DATA table. It is instead expected to be provided in the Product processor tables, and the capital charge must be calculated as per the applicable rules.

The defined pension fund asset reported must be the defined pension fund asset net of the unrestricted access and unfettered access to the assets in the fund, based on supervisory approval. The applicable amount which corresponds to the unrestricted and unfettered access to the assets in the fund, will be expected as download in the Product Processor tables. Hence the capital charge will be calculated on this.

- Internal Transactions Data Expectation

The Customer Reference code of the exposures should be of any entity's party id, which is part of the Organization Structure Dimension (**DIM\_ORG\_STRUCTURE**), to be identified as internal transactions.

- Investment in own shares Data Expectation

The Customer Reference code of the exposures should be of the parent entity's own party id, which is to be identified as investment in own shares

- Reciprocal cross holdings Data Expectation

The reciprocal cross holdings flag should be 'Y'.

- Investment in Private Equity and Hedge Funds Data Expectation

The issuer type or the customer type of the exposures should be 'HEDFND' or 'PVTEQ'

- Threshold treatment Data Expectation

The Deferred Tax Assets (DTA) related to temporary differences which are processed for the threshold treatment is expected as the download value net of deferred tax liabilities associated with that.

- Non-qualifying capital instruments Treatment:

The instruments issued prior to September 12, 2010, and which were previously qualifying in the tiers of capital must be provided as input, in the case of Depository Institutions.

The instruments issued prior to May 19, 2010, and which were previously qualifying in the tiers of capital must be provided as input, in the case of Depository Holding Institutions.

- Capital Ratios:

In the year 2014, the ratios are expected as a minimum of Advanced Approach and General Risk Ratios. The solution does not handle the General Risk based Ratios. The comparison is expected to be done outside the system

Starting from the year 2015, the standardized capital ratios are expected to be provided as an input.

## **Capital Buffers**

There are three types of Capital Buffers prescribed in the US III Rules, which are as follows:

- 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.

### **Capital Conservation Buffer**

The US III requires banks to maintain Capital Conservation Buffer (CCB) out of Common Equity Tier 1 Capital (CET1). This requirement is as per the transitional arrangement as stated in the US Regulatory Capital Final Rules.

### **Countercyclical Buffer**

The US III Rules requires banks to maintain Countercyclical Buffer (applicable for Advance Approach Bank only) that is prescribed by the respective jurisdiction's regulator through an extension of CCB. Banks determine its countercyclical capital buffer amount by calculating the weighted average of the countercyclical capital buffer amounts established for the national jurisdictions where the banking organization has private sector credit exposures. For more information on private sector credit exposures, refer to the *Glossary*.

If the guarantor and credit default swap is present for an exposure, then as per the US Regulatory Capital Final Rules the application considers the domicile country of these mitigants for the covered portion and country of the exposure counterparty for uncovered portion.

The location of a securitization exposure would be the location of the borrowers of the underlying exposures. If the borrowers on the underlying exposures are located in multiple jurisdictions, the location of a securitization exposure would be the location of the borrowers having the largest proportion of the aggregate End of Period (EOP) principal balance of the underlying exposures. If the sum of the amount of EOP principal balance is equal across jurisdictions, then this EOP principal balance will be split between these two countries equally, likewise it will be split in three countries if EOP principal balance is same across three countries.

While calculating the weighted average countercyclical buffer, the non securitized, covered positions under the market risk and securitized exposures need to be considered. For re-securitized, retail pool, and SCP transactions the country where the transaction is originated is considered. After calculating the weighted average, the application then computes a single value for Countercyclical Buffer benchmark which will be applicable on all exposures of all jurisdictions.

### **Additional Loss Absorbency Capital (for G-SIB)**

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. This is based on our interpretation of the US III that are applicable for a specific group. 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 US III Rules. Loss absorbency is required to be met as an extension of CCB for computational purposes.

### Calculation of Capital Conservation Buffer / Available Buffer from CET1 Capital

The value that the application calculates for available buffer from CET1 capital meets the buffer requirements for all three buffers - Capital Conservation Buffer (CCB), Countercyclical Buffer, and Additional Loss Absorbency Capital Requirement. No priority is given to any buffer over another. Hence, the shortfall or excess, if any, is calculated and reported at an aggregate level. The required total buffer is calculated as the sum of the required values of three individual buffers.

The application also computes CET1 and Buffer Lookup Ratio, which is further required for calculating Minimum Capital Conservation Ratio. To calculate the available buffer, remainder of following is taken:

- Excess of CET1 Capital Ratio over the benchmark (4.5%), after catering to the shortfall (if any), in the Additional Tier 1 and Tier 2 capital to their respective benchmark levels (1.5% and 2% respectively).

Hence, CCB excludes any additional CET1 needed to maintain 6% of Tier 1 capital Ratio and 8% of Total Capital Ratio.

### Maximum Payout Ratio

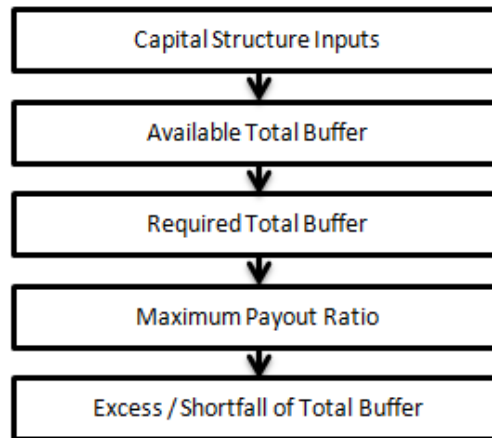
The required buffer from CET1 capital (sum of three required buffers) is compared with the Available Buffer from CET1 capital. If the banks are unable to meet their total buffer requirements for all the three buffers, then they are subject to constraints on the discretionary payments of earnings. In this case, the Maximum Payout Ratio is calculated and represents the percentage of net earnings after tax (positive) not distributed by the bank and held back as retained earnings. Maximum Payout Ratio of the current year is applied after 12 months from the time of calculation.

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**NOTE:** The application calculates Capital Buffers at consolidated level for the reporting bank. However, at the discretion of national supervisors, this can be applied at solo level as well. In such cases, the calculation of solo level for the respective jurisdictions has been included in the application.

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### Process Flow



The tasks related to capital buffer calculations are present in the process named **CAPITAL\_BUFFER**. The processing is as following:

- **Capital Structure Inputs**

The Capital Structure Rules are executed before the calculation of buffers. These Rules calculate the available capital ratios and required capital ratios of the three capital components which are 1 ratio, Tier 1 Capital Ratio, and Capital Ratio. These line items are populated in the **Fact Standard Accounting Head (FCT\_STANDARD\_ACCT\_HEAD)** table.

- **Available Total Buffer**

Calculation of Available Buffer from CET1 Capital is performed using inputs taken from the preceding step.

- **Required Total Buffer**

Calculation of Required Total Buffer is the sum of three required buffers:

- Calculation of Required Additional Loss Absorbency: A Rule in the application contains an additional source hierarchy to identify whether a bank is a G-SIB bank or not. The value is checked in the **Loss Absorbency Capital Bank Override (N\_LOSS\_ABS\_OVERRIDE)** column of the table **Fact Entity Information (FCT\_ENTITY\_INFO)** and populated to **Fact Standard Accounting Head (FCT\_STANDARD\_ACCT\_HEAD)**. This value will have precedence over the bucket specified. If the value is not present in the **Loss Absorbency Capital Bank Override (N\_LOSS\_ABS\_OVERRIDE)** column, then the loss absorbency percent is taken from the column **Bucket Loss Absorbency Capital (N\_MIN\_ADD\_LOSS\_ABS\_CAP)** of the **Benchmark Loss Absorbency Ratio (FSI\_SETUP\_BENCHMARK\_LOSS\_ABS)** table based on the loss absorbency bucket the bank belongs to.

- Required Countercyclical Buffer: Required Countercyclical Buffer Ratio (**FSI\_REQUIRED\_CNTR\_CYC\_BUFFER**) table is updated with values. The values are taken from **Benchmark Counter Cyclical Buffer Ratio (FSI\_BENCHMARK\_CNTR\_CYC\_BUFFER)** table. The **Regulator Code (V\_CAPITAL\_ADEQUACY\_REGULATOR)** column in Benchmark Counter Cyclical Buffer Ratio is compared to jurisdiction code column in Run Dimension. In a case where no Countercyclical Buffer is available, the required weighted average will be 0 as the benchmarks will be assumed to be 0. (If there is no countercyclical requirement, we expect the regulator to provide 0 as the benchmark.)

After the T2T loading, based on each country's requirement for countercyclical buffer, the weighted average Countercyclical Buffer is calculated.

- Calculation of Required Buffer from CET1 Capital, Tier1, and Capital Adequacy Ratio: For the calculation of these required buffers, based on **Updated Capital Component Group Skey (N\_UPD\_CAP\_COMP\_GROUP\_SKEY)**, which corresponds to BFCET1 - Buffers from CET1 for Required Buffer from CET1 Capital, BFT1 - Buffers from T1 for Required Buffer from T1 Capital and BFCAR - Buffers from CAR for Required Capital Adequacy Ratio), the standard account head amount is summed up and populated against the corresponding cap id in **Fact Standard Accounting Head (FCT\_STANDARD\_ACCT\_HEAD)** table.

- **Maximum Payout Ratio**

Maximum Payout Ratio is calculated based on required CET1, buffers and the setup or semi-static tables as per the year when the Run is executed.

The application assigns Maximum Payout Ratio range for a given CET1 and Buffer Lookup Ratio in table (**FCT\_CAPITAL\_CONSERVATION\_RATIO**). This table is dynamic and formula driven and is constructed by the application using the values of the three required buffers as per the Basel guidelines. The application constructs the range of CET1 and Buffer Look-up ratio (Lower Limit and Upper Limit) for the Maximum Payout Ratio in four quartiles.

**Lower Limit = 0.000001 + Upper Limit of (n-1)<sup>th</sup> quartile**

**Lower Limit of first quartile = 0.045**

**Upper Limit = 0.045 + (Total Required Buffer from CET1 capital \* 0.25 \* n)**

Where n is the quartile number

- **Excess/Shortfall of Total Buffer**

The calculated values (only positive values are considered) are stored against the corresponding Cap IDs as two separate line items of which one will be 0.

## Key Data Elements

A few key data elements have been elaborated in this section. For a complete list of tables to be updated refer to the Download Specifications document.

Countercyclical Buffer requirement for each country should be provided by the client or the bank as the percentage applicable for each country and this is dependent on the home regulator's jurisdiction as it can prescribe Countercyclical Buffer percentage that is higher than the percentage prescribed by the regulator of the exposure country. Hence, the required Countercyclical Buffer percentage for each exposure country provided as an input should be the one that the home regulator agrees to.

G-SIB status and the applicable bucket information for each entity should 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 for 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 both 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) needs to be met as per the transitional arrangement, the required buffer value needs to be setup in Setup Capital Heads (**FSI\_SETUP\_CAPITAL\_HEAD**) 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 needs to 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 should 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 of direct input of applicable loss absorbency percentage. This is also useful when the percentage applied is different from the corresponding bucket percentage. This should be given in the column **Loss Absorbency Override (N\_LOSS\_ABS\_OVERRIDE)** of the table **Stage Legal Entity Details (STG\_LEGAL\_ENTITY\_DETAILS)**. If this column has value, it is given priority over loss absorbency percentage corresponding to the bucket.

The minimum Payout Ratio requirement for different quartiles specified by different regulators 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. Payout ratios specified once are valid till the next revision.

In the **Required Counter Cyclical Buffer Ratio (FSI\_REQUIRED\_CNTR\_CYC\_BUFFER)** table the Risk Weight Amount column is updated against each country code. This is applicable for Credit Risk (for both Non Securitization and Securitization exposures).

## Bank Owned Life Insurance (BOLI) and Stable Value Wrap

BOLI is classified into two accounts, “General Account” and “Separate Account”.

General account is carried by the insurance carrier and this carrier makes all the investment decisions.

Where Separate account provides several asset class choices to the banks, and also this allows diversifying their assets within the same product.

BOLI’s separate account is frequently structured with Stable Value Protection (SVP), in the form of Special Value Wrap (SVW), which helps the smooth returns of the underlying portfolio.

Generally SVW invest in a variety of investment like short-to- intermediate-term and fixed –income investment including government, corporate and mortgage-backed bonds.

Under the US Regulatory Capital Final Rules, Banking organization that owns general account BOLI applies 100 percent risk weight to its claim on the insurance company for risk-based capital purposes.

A BOLI investment in general account exposure value is Cash Surrender Value (CSV) - Surrender charge.

The banking organization which is having investment in the BOLI in separate account is treated as an equity exposure to an investment fund. The banking organization uses one of the following look through approach from:

- Simplified Modified Look-Through Approach
- Alternative Modified Look-Through Approach
- Full Look-Through Approach

### Calculating Risk Weight Asset (RWA)

BOLI in a separate account may consist of several funds, where each fund has an underlying. BOLI account exposure amount is carrying value net of portion attributable to DAC and Mortality Reserves. Against BOLI one of the above mentioned look through approaches is applied. The approach selected is applied on all of the funds that are the part of that particular BOLI. BOLI account RWA exposure value is multiplied with the weighted average risk weight.

The weighted average risk weight is calculated as:

**Weighted average risk weight is calculated =**

Sum of the each fund risk-weight \* Exposure amount of the particular fund

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Total exposure amount across all the funds

A banking organization purchases SVP on its investment in BOLI which is a separate account.

The SVP contract protects the policy owner from declines in the value of the assets in the separate account arising from changes in interest rates.

The SVW exposure value is carrying a value attributable to SVP. The downloaded value and BOLI exposure amount is the adjusted value post deducting the amount which belongs to SVP. This can be a downloaded value.

Portion of the carrying value attributable to an SVP is at risk weighted as an exposure to the provider of the protection. The remaining portion that belongs to BOLI is treated as an equity exposure to an investment fund.

The transaction of SVW is related to the BOLI account. A relation in the staging table is provided to identify which SVW has been purchased for which BOLI account.

Banking organization that provides SVP through SVW is treated as the exposures, as if it was equity derivative on an investment fund. SVW underlying is the BOLI account for which the SVP has been provided.

RWA for the SVW (where bank is a provider) is calculated by applying one of the above mentioned three look-through approaches.

**Assumption:**

Detailing on the treatment for the amount belonging to SVP, where bank purchase the SVW is not provided in the US Regulatory Capital Final Rule but a reference is provided in the footnote of the accord.

The following is the link for the treatment for the amount belonging to SVP:

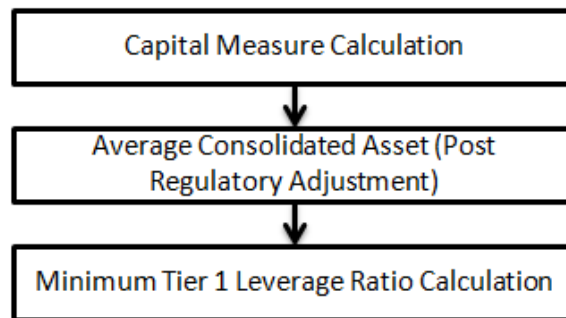
<http://www.federalreserve.gov/boarddocs/srletters/2004/SR0419a1.pdf>

Refer page number19 for more information on the treatment for SVW.

**Leverage Ratio**

US Regulatory Capital Final Rules have identified two types of leverage ratios which are as follows:

- **Minimum Tier 1 Leverage Ratio:** as per US Regulatory Capital Final Rules Minimum Tier 1 Leverage Ratio should be 4 percent. Minimum Tier 1 Leverage Ratio is calculated by dividing the organization's net tier 1 capital (post regulatory adjustment) by its average consolidated assets subtracted by the regulatory adjustment amount that is deducted from the tier 1 capital. A separate Run **USA - Basel III - Minimum Tier 1 Leverage Ratio Calculation** has been incorporated in the application to compute Minimum Tier 1 Leverage Ratio.
- **Supplementary Leverage Ratio:** As per US Regulatory Capital Final Rules Supplementary Leverage Ratio is set to minimum of 6% to qualify under 'Well-Capitalized' category while it remains same as 3% for 'Adequately Capitalized' category. The application does not capture these benchmarks and need to be captured in the system for US jurisdiction.
- Supplementary Leverage Ratio is defined as tier 1 capital / total leverage exposure. A separate Run **USA - Basel III - Supplementary Leverage Ratio Calculation** has been incorporated in the application to compute Supplementary Leverage Ratio.

**Process Flow for Minimum Tier 1 Leverage Ratio**

- **Capital Measure Calculation**

The Net Tier 1 Capital amount is calculated in the Capital Structure process (as per US III). For more information on Calculation of Net Tier 1 Capital refer to the US Capital Structure process.



- **Average Consolidated Asset (Post Regulatory Adjustment)**

The average consolidated asset value is at the consolidated Bank Holding Company level. The average consolidated asset value is at the consolidated Bank Holding Company level. The average consolidated asset value used in the Minimum Tier 1 Leverage Ratio should be provided by the bank. The value should be provided in stage legal entity detail (**STG\_LEGAL\_ENTITY\_DETAILS**) table. The line items that are deducted from Average Consolidated Assets are as follows:

- Goodwill
- Other Intangible Asset
- DTA
- Accumulated Other Comprehensive Income – AOCI
- Cash Flow Hedge Reserve
- Gain on Sale associated with Securitized Exposures
- Defined Pension Fund Asset
- Cumulative gains and losses due to changes in own credit risk
- Threshold deduction line item above 10% which is arrived at during the processing of Capital Structure and should be provided by the bank.
- Threshold deduction line item in aggregate that is above 15% which is arrived at during the processing of Capital Structure and should be provided by the bank.

The above mentioned deduction line items are marked as "Deduction from Leverage Ratio" in the **FCT\_STANDARD\_ACCT\_HEAD** and these are deducted from the average consolidated asset.

The above line items deducted from average consolidated asset follows a phase-in arrangement as defined in Capital Structure. Hence, for DTA a deduction line item, 20% of the amount is deducted from CET1 in the year 2016 and the remaining 80% is deducted from AT1. The same deduction amount is deducted from the average consolidated asset. Therefore, 20% of the amount as well as 80% of the amount needs to be deducted from the average consolidated asset.

Similarly, for Other Intangible Assets in which 20% is deducted from CET1 and remaining 80% is risk-weighted, then only the part that is deducted (that is 20%) is reduced from average consolidated asset. The risk weighted portion is not deducted.

Hence, for the following line items (where the entire amount is being deducted as per phase-in arrangement from both CET1 and AT1) is reduced from Average Consolidated Asset:

- DTA,
- Cash Flow Hedge Reserve,
- Gain on Sale associated with Securitized Exposures,
- Defined Pension Fund Asset,
- Changes in Banking Organization Creditworthiness

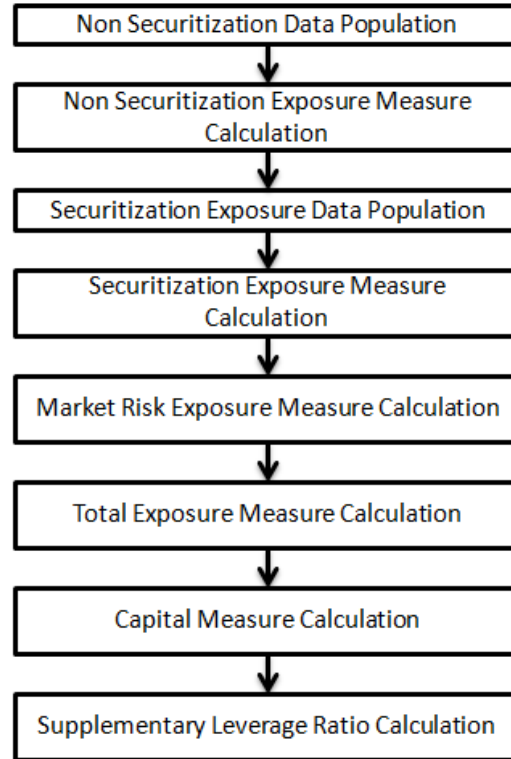
Whereas, for other intangible assets (threshold deduction amount above 10% and 15%) where only a certain portion, as per the phase-in arrangement, is being deducted from CET1, the same amount is reduced from the average consolidated asset. The remaining amount being risk-weighted is not deducted.

- **Minimum Tier 1 Leverage Ratio**

Minimum Tier 1 Leverage Ratio is calculated by dividing the organization's tier 1 capital by its average consolidated assets subtracted by the amount deducted from tier 1 capital. The tier 1 capital is considered as the net tier 1 capital. Net tier 1 capital is the summation of net common equity tier

1 (CET1) capital and net additional tier 1 capital and regulatory adjustment applied on its respective tier of capital. The Minimum Tier1 Leverage ratio, thus calculated, is stored in the **FCT\_STANDARD\_ACCT\_HEAD** table under the "USA: Leverage ratio" standard accounting head description.

### Process Flow for Supplementary Leverage Ratio



A prerequisite for Supplementary Leverage Ratio processing is market risk data population. Market risk exposure is aggregated from the outstanding positions of the instruments. Hence, population of market risk positions is a prerequisite for the exposure measure calculation of market risk. These market risk positions are expected as a direct download from the bank.

The process flow for calculation of leverage ratio is as follows:

- **Non Securitization Exposure Data Population**

Data from the Product Processors are populated to non securitization processing table in the process **Non Sec Data Population**. Non Securitization Exposure Measure used in leverage ratio is the summation of the following products:

- On-Balance Sheet Item
- Repo-Style Transaction
- Derivative Transaction
- Off-Balance Sheet Item

Details on the calculation of these exposure measures are explained in the following section.

- **Non Securitization Exposure Measure Calculation**

After data is populated in the non sec processing table, the exposure measure is calculated in the process **Non Sec Exposure Measure Calculation**. As the Credit Conversion Factor (CCF) value (which is

further used in exposure measure calculations) for off-balance sheet items is different for leverage ratio calculation and capital calculation, leverage ratio cannot be calculated as part of the Capital Calculation Run.

- **Securitization Data Population**

Securitization exposure data is populated to securitization processing table in the process **Sec Data Population**.

- **Securitization Exposure Measure Calculation**

After securitization exposure data is populated, exposure measure is calculated in the process **SEC\_EXPOSURE\_MEASURE\_CALCULATION**. Securitization transactions follow the accounting measure of exposure. The exposure amount of both the originator and investor are considered to arrive at the exposure amount. The securitization transaction where CCF assignment is applicable is assigned as prescribed in the Basel II guidelines.

- **Market Risk Exposure Measure Calculation**

Market risk data that is populated through Staging MR Data Population Run, is populated in the market risk processing table and the exposure measure is calculated in the process **Market Risk Exposure Measure Calculation**. The following market related instruments are considered for exposure measure. The total exposure measure used in the leverage ratio is the sum of the exposure amount for all products:

- Interest rate
- Equity
- Forex
- Commodity
- Options

Netting of long and short position is done at instrument level. The post netting value is considered as exposure measure. All the internal transactions, treasury stock, and reciprocal cross holding transactions is excluded while calculating the total exposure amount for the market related instruments.

While calculating exposure amount for subsidiaries that are part of regulatory consolidation and used in the leverage ratio, the exposure amount is limited to the share-holding percentage. For example: A subsidiary which is part of regulatory consolidation and parent holding in the subsidiary is 45%, only exposure amount limited to 45% is considered for exposure measure calculation. Similarly, if the holding is more than 50%, the entire amount is considered for exposure measure calculation.

- **Total Exposure Measure Calculation**

Total Leverage exposure is sum of the following exposures:

**On Balance Sheet Items:**

Accounting value of the on-balance sheet items is used. The on-balance sheet item value is net of specific provision and valuation adjustments. The on-balance sheet item does not consider the physical or financial collateral, guarantee or credit risk mitigants elements and no netting of loans and deposits. Nettable transaction related to OTC and SFT, Internal Transactions, Treasury Stock, and Reciprocal Cross-Holding does not form a part of on-balance sheet transactions.

**Repo-Style Transaction:**

Repo-style transaction (repo or reverse repos and securities lending or borrowing) follows the bilateral netting agreements and the accounting measure of the exposure. The Repo transaction undergoes volatility and FOREX haircut as defined in the US Regulatory Capital Final Rules before the exposure amount is calculated.

Derivative Transaction:

Derivative transaction (OTC Derivative product) is calculated using the Current Exposure Method as prescribed in the US Regulatory Capital Final Rules. All derivative transactions including Credit Default Swap (CDS) are assigned an add-on percent based on the underlying type as per the Current Exposure Method. The exposure amount is the sum of current exposure amount and the notional principal multiplied by the add-on percent. For transactions where bilateral netting is applicable, the exposure amount is netted and the exposure amount is calculated.

Securitizations:

Securitization transaction follows the accounting measure of exposure of securitizations. The exposure amount of both the originator and investor is considered to arrive at exposure amount. The CCF assignment of securitization exposure is as per US III rules.

Off Balance Sheet Items:

For all the off balance sheet items, excluding repurchase agreements and SFT, the notional amount which include commitments (including liquidity facilities), unconditionally cancellable commitments, direct credit substitutes, acceptances, standby letters of credit, trade letters of credit, failed transactions, and unsettled securities are considered. A uniform 10% of the notional amount is applied to all unconditionally cancellable commitments.

Market Related Instrument Items:

All market related instruments associated with interest rate, equity, FOREX, commodity, and options are considered for calculation of exposure measure. This data is expected to be a direct download value. Each instrument post netting of gross long position net of short position is considered for exposure measure except FOREX instrument. For FOREX, the exposure amount is used in the exposure measure. All the internal transactions, treasury stock, and reciprocal cross holding transactions is excluded while calculating the total exposure amount for the market related instruments.

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**Note:** If an exposure is reported in the national currency then it has to follow currency conversion if the reporting currency is different from the national currency.

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While calculating the exposure amount for the subsidiary that is part of the regulatory consolidation and used in the Supplementary Leverage Ratio, the exposure amount is limited to the share-holding percentage. Hence, if the share holding % is between 20% and 50%, the exposure amount will be limited to the percentage of the shareholding. If the shareholding percentage is greater than 50%, the entire exposure amount related to that financial entity is considered for exposure measure. However, if share-holding is less than 20%, then the exposure is not considered for exposure measure calculation.

Percentage of share-holding in the BFSI – part of Regulatory Consolidation	Part of exposure amount to be in exposure measure
<20%	Exposure will not be considered
>20% - <50%	Pro-rata basis.
>50%	Full amount to be considered.

- Supplementary Leverage Ratio Calculation

Supplementary Leverage Ratio is calculated as tier 1 capital amount divided by the total exposure measure amount. US III calls for calculation of Supplementary Leverage Ratio in conjunction to Minimum Tier 1 Leverage Ratio. As per the US III rules, the Supplementary Leverage Ratio should not be less than 3% for a banking organization and is defined as tier 1 capital / total leverage exposure. As per the US III rules, a bank should calculate the Supplementary Leverage Ratio, including each of the

ratio components, at the end of every month and then calculate a quarterly leverage ratio as the simple arithmetic mean of the three monthly leverage ratios over the reporting quarter.

For example: the Supplementary Leverage Ratio calculated for the month of January, February, and March is SL1, SL2, and SL3. The average of the Supplementary Leverage ratio is calculated as  $(SL1+SL2+SL3)/3$ .

If Supplementary Leverage Ratio is calculated in between the month, then Supplementary Leverage Ratio of the previous three months should be calculated. Tier 1 capital used in the numerator of the Supplementary Leverage Ratio is equal to net tier 1.

$$\text{Net Tier 1} = \text{Gross CET1 Capital} + \text{Gross AT1 Capital} - \text{Regulatory Adjustment to CET1} - \text{Regulatory Adjustment to AT1}$$

## Single Counterparty Exposure Limit

Single Counterparty Exposure Limit calculation has been designed to identify the counterparties whose aggregate credit exposure to the bank breaches the maximum limit as described by the Dodd Frank Single Counterparty Limit proposal. The Exposure Limit proposal is mitigating the threat to financial stability posed by systemically important financial companies.

The Single Counter Party Exposure Limit is an effort to reduce the concentration risk of a particular bank against any particular counterparty (customer and counterparty). The Dodd Frank proposal for US documents suggests stringent benchmarks to be followed by any bank for credit exposures. The application applies two limits for the reporting banks to follow in the US which are as follows:

- Any covered company together with its subsidiaries, should not have an aggregate net credit exposure to any affiliated counterparty more than 25 percent of the consolidated capital stock and surplus of the covered company.
- Any major covered company together with its subsidiaries, cannot have aggregate net credit exposure to any counterparty more than 10 percent of the consolidated capital stock and surplus of the major covered company

Covered company, including its subsidiaries, is a company whose assets are equal to \$50 billion or more. Any company which has a lesser asset size of less than \$50 billion is not eligible for single counterparty credit calculation. Any covered company with a total asset size of more than \$500 billion is considered to be a major covered company.

The application is designed to be flexible enough so that you can decide on the product types and customer types to be considered for the calculations. You can also decide on whether or not to compute Credit Risk Mitigation process so as to reduce its credit risk towards counterparty during the calculations.

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**NOTE:** Single Counterparty Exposure Limit calculations need to be done only at a consolidated level of the ultimate parent. However, there are no restrictions by the application on this. The Run is executed at any level of the hierarchy of the legal entity structure.

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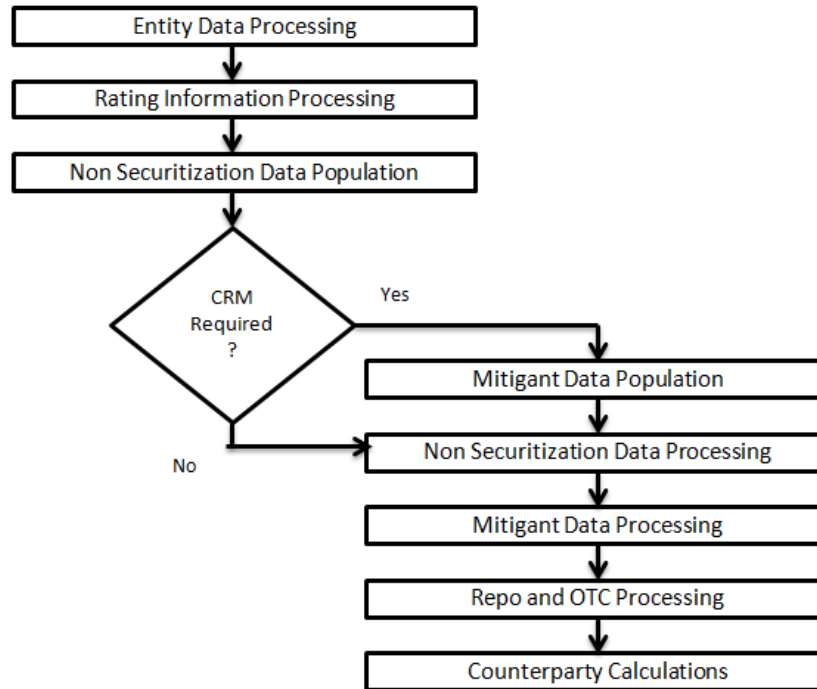
## Assumptions

Our interpretation of a few sections pertaining Single Counterparty Exposure Limit from the US Regulatory Capital Rules is as follows:

- The Dodd Frank proposal is silent on features like calculation of the exposure for OTC Derivative products. In such cases, the existing mode of calculation is as per the US Regulatory Capital Final Rules which is considered standard and replicated in the calculation process.
- The add-ons for the OTC are the same as that in the US jurisdiction.
- There is no CCF % for converting the off balance sheet items to on balance sheet items and as a result the full exposure amount for credit exposure calculation is not considered.

- The application does not consider failed trades and DVP and non-DVP trades as a part of the credit exposure as these are not explicitly mentioned in the guidelines.

**Process Flow**



- Entity Data Processing**

The entities for which the concentration ratio is calculated, are processed and identified here. Single Counterparty processing is always done at a consolidated level based on the group asset size (asset size here includes consolidated asset size of parent and all its subsidiaries). Hence, the application identifies the legal entities for which Single Counterparty Run is being executed, sorts them and the ultimate parent of the legal entities are figured out and marked. This data is required in the other tasks during processing.

User defined Run parameters are set in this process. This sets the parameters which controls how the Single Counterparty Exposure Limit Run is to be performed. The main parameter set in Single Counterparty Run during this process is the ‘CRM required’ indicator, which controls whether the risk mitigation process is required or not. While running the user defined Run for Single Counterparty Exposure Calculation, Run Definition User Defined Run Param Assignment Rule has to be modified to set the user defined Run parameter to the following values depending on whether CRM is required or not:

Setup Code	CRM
USASCP-MIT-NO	No
USASCP-MIT-YES	Yes

From the Run Management screen, the required CRM can be set using the option icons.

- Rating Information Processing**

The application does the following in this process:

- Rating data population
- Rating reclassification into the standard ratings
- Sovereign ratings population

In single counterparty Run, ratings are required during the assignment of haircuts. Dodd Frank act proposes the use of only ECA scores (to be referred like sovereign ratings) in the Single counterparty Run. Therefore, all the credit ratings by the external agencies are disregarded. The application reclassifies the rating information (ECA score) shared in the bank's data to standard rating, according to which risk treatment is done.

- **Non Securitization Data Population**

This process takes care of all the data population for the all the eligible product types from the available product processors. The valid credit exposures as per the Dodd – Frank's proposal are as follows:

- Loans, deposits, lines of credit, leases
- Debt securities (held till maturity and held for trading)
- Equity securities
- Repo and reverse Repo Transactions
- Securities lending and borrowing Transactions
- Guarantees, acceptances, or letters of credit
- Derivative transactions – Both Qualifying and Non Qualifying for master netting agreement
- Credit or equity derivative

Data should be loaded in the application for all the product types. Main categories of CR non sec exposures, along with their respective table names that are used for data input are as follows:

Higher Level Product Type	Table name for data input (Also known as <b>Product Processor</b> )
Bills	STG_BILLS_CONTRACTS
Credit Cards	STG_CARDS
Swaps	STG_SWAPS_CONTRACTS
Futures	STG_FUTURES
Guarantees	STG_GUARANTEES
Investments	STG_INVESTMENTS
Lease Contracts	STG_LEASE_CONTRACTS
Letters of Credit	STG_LC_CONTRACTS
Loans	STG_LOAN_CONTRACTS
Money market instruments	STG_MM_CONTRACTS
Overdraft	STG_OD_ACCOUNTS
Options	STG_OPTION_CONTRACTS
Re purchase contracts	STG_REPO_CONTRACTS
Equity Exposures	STG_EQUITY_EXPOSURES
Underlying exposures for repo contracts	STG_UNDERLYING_EXPOSURES
Credit Derivatives	STG_CREDIT_DERIVATIVES

Stage data from the product processors or other stage tables is populated in the required tables, where data is further processed. For more information on the list of columns to be populated within each table, refer to the *Download Specifications* document. The application identifies counterparties that are eligible to be processed under single counterparty Run are marked as eligible through rule RLBL0147: **Single Counterparty - Concentration Treatment Eligibility**.

The eligibility Rule is based on the counterparty type. This is a reconfigurable Rule that can be modified to include or exclude the counterparty type as per customer's requirement. Currently, the following counterparty types are marked as eligible for Single Counterparty calculations:

- Banks
- Corporate – Large
- Corporate – Medium
- Corporate – Small
- PSE - sovereign status
- Securities Firm treated as Bank
- Securities firm treated as Corporate Non -SME

Currency Conversion: The amount data columns that are provided as input (in stage tables) are in the natural currency. In this step, the application converts them to reporting currency columns which are used for further calculations. The column names suffixed as ‘\_ncy’ are in the natural currency and they are multiplied by currency conversion factor to populate values in the reporting currency.



Shareholding percent multiplication: The exposure amount, that is, a part of input data (product processors) is the exposure amount for a solo entity. However, in case of a consolidated Run, the parent exposure is considered only on the basis of shareholding percentage, based on the following calculation:

$$\text{Exposure Amount} \times \text{Share Holding Percent} = \text{Updated Exposure Amount}$$

where share holding percent is allotted a value by the application during the process- Capital Consolidation.

- **Mitigant Data Population**

The data related to the mitigants associated to the exposures are captured in this process. The application does the following in this task:

- Mitigant data population to their corresponding tables is done.
- Currency conversion from natural currency to reporting currency for the required columns
- Shareholding percent multiplication for the required mitigant data
- Mitigant to Non Sec Exposure mapping population

- **Non Securitization Data Processing**

The Non Securitization related data is processed here. The application processes in the following way:

Reclassification: Product types used by reporting bank in the input data are reclassified to standard product types recommended by Basel Committee in the accord. The product types after reclassification are stored as Basel product types. The reclassification is based on a simple logic.

For Example: Unsecured Bonds is reclassified as Debt Securities. Exposure at Default – EAD of the exposures is calculated for each product. The EAD calculation for all the exposures is done on the basis of standard product types as per the recommendations of US III.

If a new standard product type is added to the single counterparty Run, then it has to be mapped to one of the EAD calculation Rules if the EAD calculations are similar. If it is not similar, a new Rule has to be created for this purpose.

- **Mitigant Data Processing**

The application handles multiple mitigants for credit risk mitigation like cash, debt securities, Guarantees, Credit derivatives, and so on. The mitigant types are reclassified as standard mitigant types. These are then identified as eligible or not based on the eligibility Rules. The application has pre-configured Rules to carry out the mitigant eligibility checks. There are separate eligibility Rules for different standard mitigants types. All cash and debt securities are marked as eligible. Equity is classified as eligible mitigant based on whether it is publicly traded equity or not. All Credit derivatives and guarantees are treated as eligible based on their standard issuer types.

- **Repo and OTC Processing**

The processing of OTC and SFT products are done in the process. For SFT calculations the application does the following:

The exposure volatility haircut for the underlying instruments of SFT is calculated. Haircut for debt securities issued by sovereign and non sovereign issuers is calculated in two separate Rules based on the US III recommendations. The input to haircut calculation for debt securities with non sovereign issuers is the residual maturity. The inputs to haircut calculation for debt securities with non sovereign issuers are the residual maturity, ECA score of the country. Haircut of 0.25 is applied to all equity collaterals through a separate Rule.

Forex haircut for the underlying instruments of SFT is calculated via the FOREX haircut rule. 8% FOREX haircut is applied in case of any currency mismatches between the collateral and the exposure that is being covered by that collateral.

Pre mitigation and post haircut exposure amount (exposure at default) is calculated for SFT

Gross current exposure amount for OTC products represents the current exposure that the bank is subjected to through these instruments. It is calculated for all OTC products based on their current market value.

Gross potential exposure amount for OTC products is the potential exposure that the bank may be subjected to in case of credit event. This is calculated based on the notional amount. Gross potential exposure amount of all credit derivatives (where reporting bank has sold credit protection) is calculated on the basis of unpaid premium, notional principal and Non Sec Add on Percent.

Net Current exposure amount is calculated based on the market value.

Net Gross Ratio Calculation for OTC Derivatives is done by dividing Net Current Exposure Amount by Gross Current Exposure Amount

Net potential exposure value is calculated as:

$$\mathbf{0.4 * Gross Potential Exposure Amount + 0.6 * Net Gross Ratio * Gross Potential Exposure Amount}$$

Net current and potential exposure values for OTC and its derivatives are calculated.

Total exposure values are calculated by summing Net Potential Exposure Amount and Net Current Exposure Amount

- **Counterparty Calculations**

All the credit risk mitigation process and the final Single counterparty calculations are done in this process. The major tasks that are performed in this process are:

CRM volatility haircut is applied for all mitigants and FOREX haircut is applied in case of currency mismatches.

Mitigation allocation process is handled through the optimizer. The process to allocate Mitigants are as follows:

- The group of all the exposures which are mapped to a mitigant and all the mitigants which are mapped to an exposure are grouped under a pool and a pool id is given.

For example, consider the mapping between few exposures and mitigants as follows:

Exposure 1 → Mitigant 1  
 Exposure 2 → Mitigant 1  
 Exposure 2 → Mitigant 2  
 Exposure 3 → Mitigant 2

The Exposures 1, 2, and 3 and Mitigants 1 and 2 will form a pool and a pool ID is provided for it. The mitigants within the same pool are allocated to the exposures in the following order:

- Pre mitigation EAD in descending order
- Residual maturity of the exposure in ascending order
- Probability of default in ascending order
- Loss given default in ascending order
- If the mitigant is Cash or Gold, then it gets the top priority
- Mitigant value in descending order
- Residual maturity of the mitigant in ascending order
- Probability of default of the mitigant in ascending order
- Loss given default of the mitigant in ascending order

The exposure mitigant mapping is given a rank within the pool before they are fed into the optimizer for mitigant allocation. This rank is again modified for the cases where N exposures are mapped to 1 mitigant (*N – 1 referred to as ‘N to 1’ case*). For an N – 1 pool, the mitigant allocation rank is reversed. For a non N – 1 pool, if the exposure is mapped to an Uncovered mitigant, then the rank is modified to MAX(rank) within the pool + 1 so that the uncovered mitigant is allocated in the last.

This rank ordering of the mitigants with respect to the exposure are handled using the Data Transformation “Counterparty\_Miti\_Rank”. The details of the Data Transformation are as follows:

Data Transformation Name	Objective	Processing Logic
Counterparty_Miti_Rank	The objective of this Data Transformation is to allocate the ranks to the exposures and the mitigants in the case of N-1, 1-N and N-N mappings, for single counterparty.	For each exposures and mitigants within a pool, the solution first identifies whether the exposure-mitigant mapping belongs to N-1 or Other mapping. Then, for the N-1 mapping, the solution rank orders the exposures and the mitigants based on the least residual maturity of the mitigant, least PD percent and least LGD percent.

Post CRM covered amount is calculated as the product of Pre-Mitigation EAD Amount and Covered Factor. Single Counterparty Threshold Limit is calculated for both covered companies and major covered companies as 25% and 10% of accounting capital and surplus. The application compares the Net Credit exposure with Single Counterparty Threshold Limit. If Counterparty Net Credit Exposure > Counterparty Threshold Amount, the application updates the Counterparty Threshold Limit Breach column as Y, else it is updated as N.

## Key Data Elements

There are certain mandatory details about the product that are provided as download which cannot be calculated in the product processor table without which the exposure value cannot be computed. For a complete list of tables and columns refer to the Download Specifications document.

The mandatory data that has to be provided for the different products are as follows:

- Lending Instruments - Current Exposure Value
- Equities – Equity Market value, Carrying cost
- Debt Securities – EOP Balance
- REPO - Underlying exposure value
- Guarantees and Letter of Credit - the exposure value, maximum potential loss
- OTC Derivatives - MTM value, Notional principal of the derivative
- Credit or Equity Derivatives - Exposure value, maximum potential loss

All of the above mentioned product types are included in the Gross Exposure calculation. While populating data the application also takes care of the currency conversion from natural currency to the reporting currency. The capital and surplus for the consolidating entity is expected as a download in **Stage Legal Entity Details (STG\_LEGAL\_ENTITY\_DETAILS)** table as a single line item. Asset size of the entity is expected to be a download in **Stage Party Financials (STG\_PARTY\_FINANCIALS)**.



## Chapter 5 Application Processing

### 5.1 Pre-processing Steps

#### 5.1.1 Data Requirements

Data can be divided into the following categories:

#### Setup Tables

A setup table is a set of data that is static and does not change on regular intervals. This is a set of seeded data which refers to the initial data that is provided with the application. DIM\_Bands table needs to be setup for the bands which are not used for regulatory reporting. Data should be setup for these bands:

Sl. No.	Column Name	Comments
1	D_RECORD_END_DATE	Date till the value of the band can be used
2	D_RECORD_START_DATE	Any date less than or equal to FIC_MIS_DATE
3	FIC_MIS_DATE	MIS Date of the run
4	F_LATEST_RECORD_INDICATOR	Should be 'Y' for the latest records
5	F_LOWER_VALUE_INCLUSIVE	Should be 'Y' if the value in N_BAND_LOWER_BOUND_VALUE should be included in the range; else 'N'
6	F_UPPER_VALUE_INCLUSIVE	Should be 'Y' if the value in N_BAND_UPPER_BOUND_VALUE should be included in the range; else 'N'
7	N_BAND_CODE	Distinct code should be provided for each member of a band type
8	N_BAND_LOWER_BOUND_VALUE	Lower bound value of the range
9	N_BAND_SKEY	Distinct surrogate keys should be provided for each records in the table
10	N_BAND_UPPER_BOUND_VALUE	Upper bound value of the range
11	V_BAND_CATEGORY	Band Category
12	V_BAND_CATEGORY_DESC	Band Category Description
13	V_BAND_SHORT_DESC	Band Short Description
14	V_BAND_SUB_CATEGORY	Band Sub Category
15	V_BAND_SUB_CATEGORY_DESC	Band Sub Category Description
16	V_BAND_TYPE	Band Type should be codes mentioned in Table 2
17	V_BAND_UNIT	Band Unit

The Band type codes for Dim\_Bands table is as follows:

Sl. No.	Band Types
1	DELINQUENCY BAND
2	EXPECTED LOSS BAND
3	LTV BAND
4	LTV BAND USFR
5	MATIRBCB
6	MATURITY BAND
7	MR TIME BAND

8	OPERATIONAL LOSS
9	PD BAND
10	PD BAND USFR
11	RW BAND

### ***Dimension Population***

This section provides steps required to setup and execute the slowly changing dimension process.

#### **Overview of SCDs**

This component is used 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. This is applicable for dimensions like the Exposure Dimension. There are also tables like the Product dimension where the SCD process for this ideally is needed only when new product types are introduced. 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.

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

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 to 'Personal Loan' from 'PL' in the earlier example in the next processing period then, when SCD is executed then the record in the earlier example would be changed to

N_Product_Skey	V_Product_Name	D_Start_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 has

to be preserved then the V\_Product\_Name column has to be set as Type 2 in which case when SCD is processed for the processing period in which the change happens it will insert a new record as shown in the example below.

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'.

### Pre-requisites

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 will only need to add entries in these tables if you add user defined dimensions.

### Tables used by SCD Component

The SCD Components provide the details of mapping between the Stage Table and its corresponding Dimension table. Sys\_table\_master and Sys\_stg\_join\_master form part of the SCD Components and are executable for each report extraction date (MIS). The tables provide information on whether the history of a table attribute is maintained or not.

### SYS\_TBL\_MASTER

The application installer will populate one row per dimension for the seeded Dimensions in this table.

Column Name	Data Type	Column Description
MAP_REF_NUM	NUMBER(3) NOT NULL	The Mapping Reference Number for this unique mapping of a Source to a Dimension Table.
TBL_NM	VARCHAR2(30) NOT NULL	Dimension Table Name
STG_TBL_NM	VARCHAR2(30) NOT NULL	Staging Table Name
SRC_PRTY	NUMBER(2) NULL	Priority of the Source when multiple sources are mapped to the same target
SRC_PROC_SEQ	NUMBER(2) NOT NULL	The sequence in which the various sources for the DIMENSION will be taken up for processing
SRC_TYP	VARCHAR2(30) NOT NULL	The type of the Source for a Dimension i.e., Transaction Or Master Source.
DT_OFFSET	NUMBER(2) NULL	The offset for calculating the Start Date based on the FRD
SRC_KEY	NUMBER(3) NULL	Source Key

Example data: The following data is inserted by the application installer for the 'Product' dimension (DIM\_PRODUCT).

Row	Fields
DT_OFFSET	0
MAP_REF_NUM	78
SRC_KEY	
SRC_PROC_SEQ	7
SRC_PRTY	
SRC_TYP	MASTER
STG_TBL_NM	STG_PRODUCT_MASTER
TBL_NM	DIM_PRODUCT

The following are the columns and data type particulars that the SCD Executable uses



Column Name	Data Type
MAP_REF_NUM	NUMBER(3) NOT NULL
TBL_NM	VARCHAR2(30) NOT NULL
STG_TBL_NM	VARCHAR2(30) NOT NULL
SRC_PRTY	NUMBER(2)

The following table lists out Stage tables and its corresponding Dimension tables which are used in the BASEL product.



MAP_REF_NUM	DIM TABLE	STG TABLE
1	Dim_Acct_Status	STG_ACCOUNT_STATUS_MASTER
12	Dim_Branch	STG_BRANCH_MASTER
25	Dim_Commodity	STG_COMMODITY_MASTER
28	Dim_Country	STG_COUNTRY_MASTER
42	Dim_Exposure	STG_EXPOSURE_MASTER
43	Dim_Exposure	VW_BASEL_STG_FCT_BNK_IN ST_EXP
47	Dim_Geography	STG_GEOGRAPHY_MASTER
51	DIM_INDUSTRY	STG_INDUSTRY_MASTER
53	DIM_INSTRUMENT_CONTRACT	VW_STG_INSTRUMENT_CONTRACT
61	DIM_LOB	STG_LOB_MASTER
64	DIM_MARKET_VARIABLES	STG_MARKET_VARIABLES_MASTER
69	Dim_Mitigant	STG_MITIGANT_MASTER
70	Dim_mitigant_type	STG_MITIGANT_TYPE_MASTER
71	Dim_MR_Asset	STG_MR_ASSET_MASTER
78	DIM_PRODUCT	STG_PRODUCT_MASTER
99	Dim_Sec_Pool_Type	STG_SEC_POOL_TYPE_MASTER
100	Dim_Sec_Program	STG_SEC_PROGRAM_MASTER
105	Dim_Src_System	STG_SOURCE_SYSTEM_MASTER
110	Dim_trading_desk	STG_TRADING_DESK_MASTER
122	Sec_Pool_Master	STG_SEC_POOL_MASTER
168	DIM_PARTY	STG_PARTY_MASTER
179	Dim_Issue	VW_STG_ISSUE
180	DIM_PARTY_TYPE	STG_PARTY_TYPE_MASTER

MAP_REF_NUM	DIM TABLE	STG TABLE
181	FSI_BENCHMARK_CAP_CONS_RATIO	STG_BENCHMARK_CAP_CONS_RATIO
182	FSI_BENCHMARK_CNTR_CYC_BUFFER	STG_BENCHMARK_CNTR_CYC_BUFFER

**SYS\_STG\_JOIN\_MASTER**

Column Name	Data Type	Column Description
MAP_REF_NUM	NUMBER (3) NOT NULL	The Mapping Reference Number for this unique mapping of a Source to a Dimension Table
COL_NM	VARCHAR2(30) NOT NULL	Name of the column in the Dimension Table
COL_TYP	VARCHAR2(20) NOT NULL	Type of column. The possible values are given below
STG_COL_NM	VARCHAR2(30) NOT NULL	Name of the column in the Staging Table
SCD_TYP_ID	NUMBER(3) NULL	SCD type for the column
PRTY_LOOKUP_REQD	CHAR(1) NOT NULL	Column to determine whether Lookup is required for Priority of Source against the Source Key Column or not
COL_DATATYPE	VARCHAR2(15) NULL	Column Data Type
COL_FORMAT	VARCHAR2(15) NULL	Column Format

The possible values for column type (the column COL\_TYPE) in SYS\_STG\_JOIN\_MASTER are:

- PK – Primary Dimension Value (may be multiple for a given "Mapping Reference Number")
- SK – Surrogate Key
- DA – Dimensional Attribute (may be multiple for a given "Mapping Reference Number")
- SD – Start Date
- ED – End Date
- LRI – Latest Record Indicator (Current Flag)
- CSK – Current Surrogate Key



- Enter the Task ID and Description.
- Select Run Executable, from the Component ID list.
- Click Parameters. A pop up window will open, enter the following values and then click Save:
- Executable : scd,<map ref num>>

For example, scd, 2.

The Basel batch created for SCDs is the <infodom>\_SCD. Infodom refers to the Information Domain name. The map\_ref\_num can be looked up from table 7.

Wait: 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 to select 'Yes' or 'No'. Clicking Yes confirms that you wish to wait for the execution to be complete. Clicking No indicates that you wish to proceed.

Batch Parameter: Select 'Y' (upper case required)

## Stage Data

In this section, Stage Data can be populated in either the Product Processors or Other Stage tables as given below:

- **Product Processor:** is an entity in the Basel Regulatory Capital application which 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 have been 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, refer to the *Download Specifications* document.

The set of sample data to be populated for the following tables are listed in the attached worksheet.

- Stg\_product\_master
- Stg\_lob\_master
- Stg\_mitigant\_type\_master
- Stg\_party\_type\_master



Sample\_Data.xls

## 5.1.2 Data Assumptions

The following section aims to identify certain data related assumptions for specific tables which will help in the smooth functioning of the Basel Regulatory Capital application.

### Dimension Table:

**DIM\_CAPITAL\_ACCT\_HEAD:** GL items and Non GL items are differentiated in the column **F\_GL\_IDENTIFIER** with flag Y indicating GL items and flag N as an indicator for non-GL items)

### Mapping Table:

**FSI\_CAPITAL\_STANDARD\_MAPPING:** For certain standard account head line items which are

processed by the application (for example: **Net Tier 1 Capital, Total eligible capital, Tier 1 Capital Ratio, Capital Ratio**) you are expected to provide the 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**

#### **FACT Table:**

**FCT\_CAPITAL\_ACCT\_HEAD:** GL items and non-GL items are differentiated in the column **F\_GL\_IDENTIFIER** with Flag **Y** indicating GL items and Flag **N** indicating non-GL items. The T2T which populates data from **STG\_GL\_DATA** to the table **FCT\_CAPITAL\_ACCT\_HEAD** populates value **Y** in the column **F\_GL\_IDENTIFIER**. The T2T which populates data from **STG\_STANDARD\_ACCT\_HEAD** to the table **FCT\_CAPITAL\_ACCT\_HEAD**, populates value **N** in the column **F\_GL\_IDENTIFIER**. The reclassification of GL and non GL skeys to standard account head skey (**N\_STD\_ACCT\_HEAD\_SKEY**) happens in **FCT\_CAPITAL\_ACCT\_HEAD** table by either the following:

- A Type 2 rule to reclassify using **DIM\_CAPITAL\_ACCT\_HEAD** and **DIM\_STANDARD\_ACCT\_HEAD**.
- Referencing the mapping table – **FSI\_CAPITAL\_STANDARD\_MAPPING**.

From the **FCT\_CAPITAL\_ACCT\_HEAD** table both GL and Non GL data flows into **FCT\_STANDARD\_ACCT\_HEAD** table. Again, the distinction is based on the flag **Y** in the column **F\_GL\_IDENTIFIER**.

### **5.1.3 Data Loading**

The OFSAAI Data Integrator framework allows you to move data flexibly within the Oracle Financial Services Analytical Applications (OFSAAI) Data Model at different levels of granularity and at 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 remote server
- Flat-Files: Flat File data source lets you define the Flat File present locally or remotely with FTP access to 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 format of the flat file or RDBMS file refer to the *Download Specifications* document.

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

- Excel upload: Choose this option when you have moderate quantities of data that is 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 Screens 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, refer to the *OFSAAI 7.3 User Manual*.

For more information on Data Entry forms, refer to *Data Entry Forms and Queries* on page 31.

## 5.1.4 Reclassification Rules

A sample list of Products, Customer Types, Issuer Types, Collateral Types, Credit Ratings, and Organization Structure are pre-defined in the Basel Regulatory Capital 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 to just re-classifying the Bank's data into the relevant standard classifications.

### Setting up the Data

The respective Dimension Tables corresponding to Products (**DIM\_PRODUCT**), Customer Types, Issue Types (**DIM\_PARTY\_TYPE**), Collateral Type (**DIM\_MITIGANT\_TYPE**), Credit Ratings (**RATING\_SRC\_MASTER** and **DIM\_CREDIT\_RATING**) and Organization Structure (**DIM\_ORG\_STRUCTURE**) need to be 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 a period of time.

Also data is expected in **STG\_PRODUCT\_MASTER**, **STG\_PARTY\_TYPE\_MASTER** and **STG\_MITIGANT\_TYPE\_MASTER** for product, party type and mitigant types. SCDs will populate data from these tables into **DIM\_PRODUCT**, **DIM\_PARTY\_TYPE** and **DIM\_MITIGANT\_TYPE**.

### Modifying the Re-Classification Rules

The hierarchies related to Product Types, Customer Types, and so on, needs to 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 OFSAAI screen. A new node is created in the source hierarchy. This node has to be mapped to the node in the target to be added in the target hierarchy. The pre-configured reclassification rules are modified to map the Bank's data to the Standard data using the Rules Framework. For more information, refer to *Components of OFSAA Infrastructure* on page 9.

## 5.2 *Processing*

### 5.2.1 Introduction

Once 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, refer to the *Run Charts*. To execute Runs as batches refer to the Operations section, refer to the *OFSAAI 7.3 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 in a manual or real-time basis, as required. Existing investments in external schedulers can also be used to call web services within this infrastructure.

### 5.2.2 Batch Processing

A batch refers to a set of executable processes based on a specified rule. Batches relating to the Basel Regulatory Capital application needs to be executed as specified below. These batches are executed from the Operations Menu of OFSAAI. For more information of the Operations section, refer to the *OFSAAI 7.3 User*



*Guide.*

- Slowly Changing Dimension batch: The needs to be executed when you are installing the application for the first time. Subsequently, this batch needs to 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.
- Basel Common batch: The following tasks are mapped to the Basel Common batch:

Data 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.

- PARTY\_FINANCIAL\_DATA\_POPULATION Batch: Populates the party financial data. Need to be executed as required when the party financial data is available.
- BASEL\_DAILY Batch: This batch is to be executed on a daily basis. This batch is used to populate the exchange rate between different currencies for each date.

### 5.2.3 Run Management

The Run Management 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 and execute 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 GUI. The Run Management GUI lists all Runs defined in Rules Framework. For more information, refer to *Rules Framework* on page 90.

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**NOTE:** For CBRC Jurisdiction, if Credit Risk is selected in Run Management, then the relevant questions will not be 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.

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The Basel Run Management UI consists of the following 3 functionalities:

- **Portfolio Definition:** wherein 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 sub type of an entire portfolio for processing. The other features of **Portfolio Definition** are:

View details of a defined Portfolio

Existing values of a Portfolio can be edited

A new Portfolio can be created by copying the existing values of a defined Portfolio

- **Run Definition:** wherein you can define a Run for the Portfolios defined in the **Portfolio Definition** screen by selecting the Basel approaches relevant to the jurisdiction. The other features of the **Run Definition** are as follows:

View details of a defined Run

The existing values of a Run can be edited.

- **Run Execution:** wherein you can define the parameters of a Run and execute a Run. The other features of the **Run Execution** are as follows:

View defined parameters of a Run.

Parameters can be entered at the Run Level.

The Existing Parameter values can be edited and there is an option to create and execute a batch.

## Portfolio Definition

### Adding a New Hierarchy for Portfolio Creation

To add a new hierarchy for portfolio creation the hierarchy code needs to be added in **PORTFOLIO\_HIERARCHY\_MASTER** as shown below:

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_END_DATE	End date of the hierarchy.

### Portfolio Definition Screen

To access the Portfolio Definition Screen:

1. Click **Risk Applications** on the Left Hand Side (LHS) pane of OFSAAI Screen.
2. Click Basel Regulatory Capital.
3. Click **Portfolio Definition**.







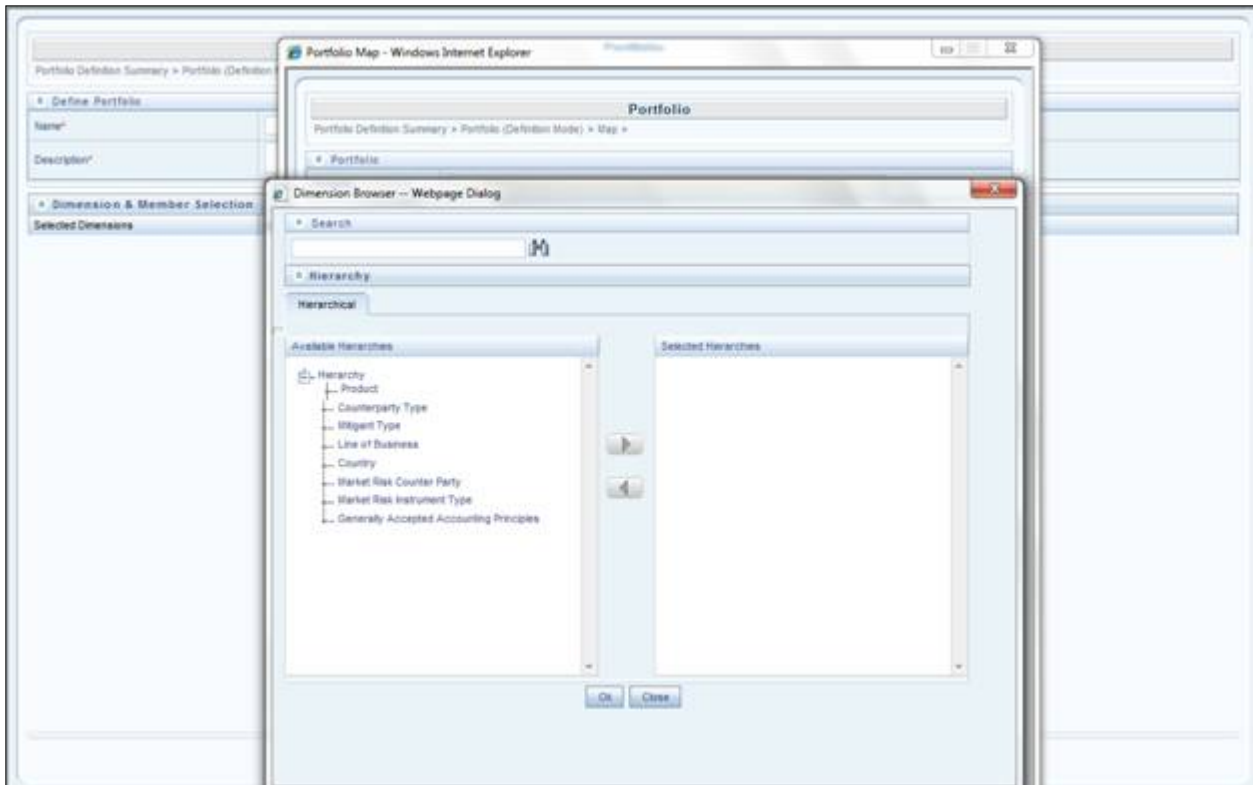
### Portfolio Definition UI Icons


Buttons Name	Icon	Description
Pagination Options		Helps in navigating from one page to another
View		Helps to view details of a defined Portfolio
Edit		Clicking this icon allows you to update details of a defined Portfolio
Add		Helps in defining a new Portfolio
Copy		Click this icon to create a new Portfolio using the same parameters of an existing Portfolio
Dimension		Click this Icon to select the Dimensions and Hierarchy to define a Portfolio
Delete		Click to Delete a Portfolio
Search		This icon helps in searching a particular Portfolio. Type the Portfolio Name in the <b>Name</b> Text Box and click this icon.
Reset		The Reset icon refreshes the Portfolio Name field back to the default blank field

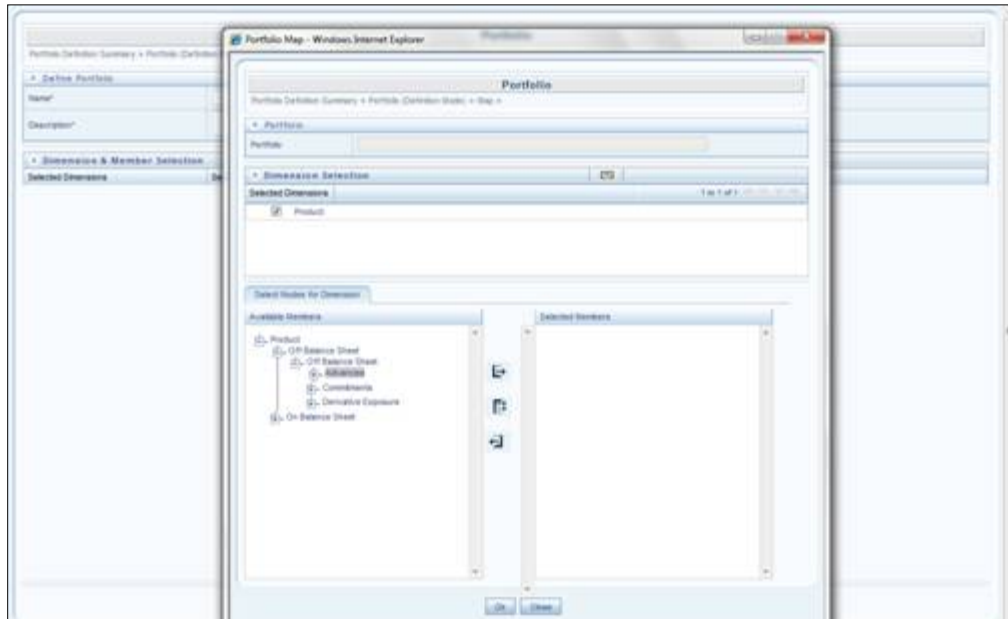
### Defining a Portfolio

To define a Portfolio, refer to the following steps:

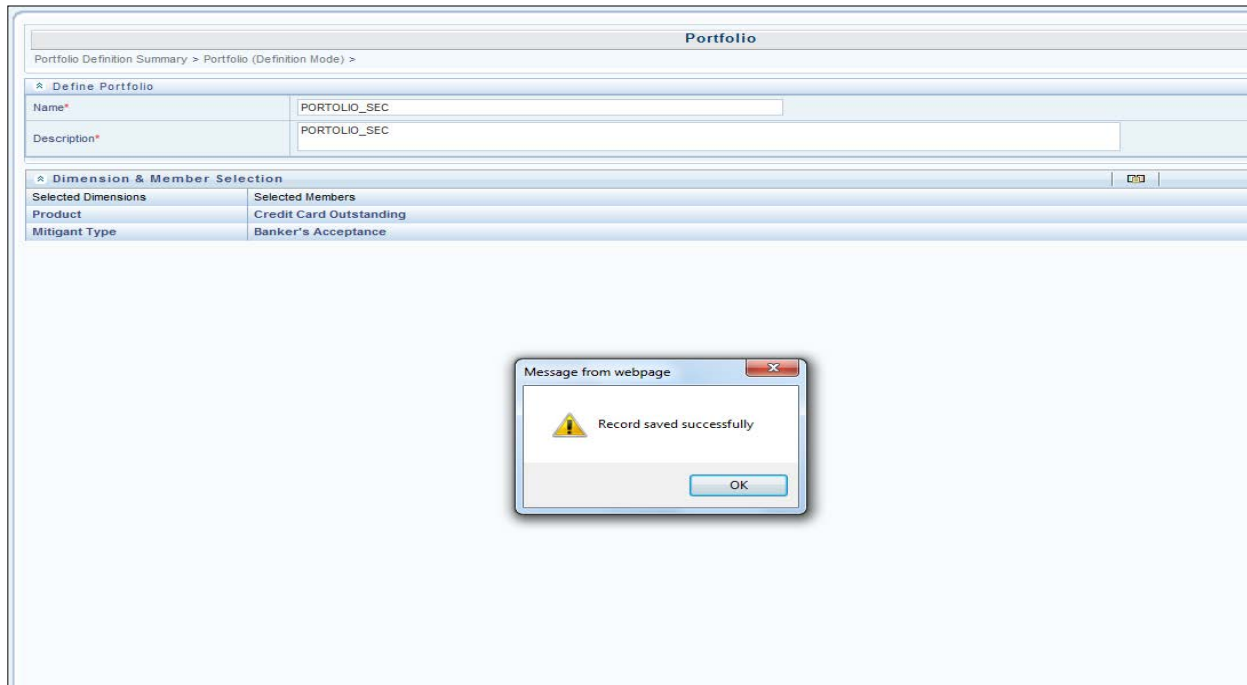
4. Click  in the navigation bar of the **Portfolio** screen, to define a new Portfolio. The **Portfolio (Definition Mode)** screen is displayed.
5. Enter the **Name** and **Description** of the new Portfolio in the **Portfolio (Definition Mode)** screen.
6. Click  in the **Dimension & Member Selection** section of the **Portfolio (Definition Mode)** screen. The **Portfolio Map** screen is displayed.
7. Click  in the **Portfolio Map** screen and select the relevant Dimensions in the **Filter Browser** screen by clicking . The selected Dimension appears in the **Portfolio Map** screen.



8. Click  on the Dimension appearing in the **Portfolio Map** screen to select the Nodes of the selected Dimension shown in the following figure:



9. Click 'OK' on **Portfolio Map** screen after selecting nodes. Click Save on **Portfolio (Definition Mode)** screen to save the portfolio as shown in the following figure:



## Run Definition

To access the Run Definition Screen:

1. Click **Risk Applications** on the Left Hand Side (LHS) pane of OFSAAI Screen.
2. Click **Basel Regulatory Capital**.

3. Click **Run Definition** on the LHS Pane. The Run Summary Screen is displayed, wherein you can define your own Runs.

### Run Definition UI icons

Buttons Name	Icon	Description
Pagination Options		Helps in navigating from one page to another
View		Helps to view details of a defined Run
Edit		Click this icon to allows you update details of a defined Run
Add		Helps in defining a new Portfolio
Delete		Click to Delete a Run
Search		This icon helps in searching a particular Run. Type the Run Name in the <b>Run Name</b> Text Box and click this icon.
Reset		The Reset icon refreshes the Run Name field back to the default blank field.

### Defining a Run

Follow the steps given below to define a new Run:

1. Select the relevant jurisdiction from the Segment dropdown in the Run Management Screen.
2. Click to add a new run.
3. Select the Regulation for which the Run needs to be created.

4. Enter the name of the Run and a relevant description in fields Run Name and Comments respectively, in the Run Management screen.

5. Click to select the relevant run type (Capital Calculation or Single Counterparty Exposure) for which you want to create the Run, shown in the following figure:

In a Capital Calculation Run the application calculates the Risk Weights, EAD and the RWA for all the credit exposures to a single counterparty. In this run we also calculate the capital adequacy ratio to the reporting agency. In a Single Counterparty run, the application only calculates the concentration of Credit exposure against a particular counterparty. No RWA calculation or CAR calculation required.

If you are creating a Capital Calculation Run:

- i. Click to select the relevant risk type for which you want to execute the Run, shown in the following figure:

Select			
Select	<input checked="" type="checkbox"/> Credit Risk	<input type="checkbox"/> Market Risk	<input type="checkbox"/> Operational Risk
Capital Structures	<input type="radio"/> Yes <input checked="" type="radio"/> No	CRM	<input checked="" type="radio"/> Yes <input type="radio"/> No

- ii. Click  to select Yes or No to include or exclude Capital Structure Computation and CRM (CRM is the process which incorporates the eligible deductions provided against specific exposures by the bank) functionality in the Run, shown in the preceding figure.
- iii. Click the relevant Risk tab (highlighted as per earlier selection of risk type) to select the approaches within each risk type, shown in the following figure:

Credit Risk	Market Risk	Operational Risk
-------------	-------------	------------------

If you are creating a Single Counterparty Run:

- i. Click  to select Yes or No to include or exclude CRM (CRM is the process which incorporates the eligible deductions provided against specific exposures by the bank) functionality in the Single Counterparty Run, shown in the below figure:

Single Counterparty Exposure	
CRM	<input checked="" type="radio"/> Yes <input type="radio"/> No

- ii. Only Credit Risk tab will be enabled for Single Counterparty run as shown in the below figure:

Credit Risk	Market Risk	Operational Risk
-------------	-------------	------------------

- 6. For a Capital Calculation Run, click  against **Portfolio Identifier** to select the defined Portfolios to participate in the Run. The relevant approaches will appear in the Basel II Approaches section (For example: **Non Securitization Standardized**). Click  to view the sub approaches under section **Basel Regulatory Capital Approaches** as shown in the following figure:

For Single Counterparty Run, click  against **Portfolio Identifier** to select the defined Portfolios to participate in the Run. The relevant approaches will appear in the **Basel Regulatory Capital** Approaches section (For example: **Single Counterparty Exposure Calculation**). Click  to view the sub approaches under section **Basel Regulatory Capital** Approaches as shown in the following figure:

Credit Risk	
Basel Regulatory Capital Approaches	<input type="checkbox"/> Portfolio Identifier
<input checked="" type="checkbox"/> Non Securitisation Standardized	
<input checked="" type="checkbox"/> Non Securitisation FIRB	
<input checked="" type="checkbox"/> Non Securitisation AIRB	
<input checked="" type="checkbox"/> Securitisation Standardized	
<input checked="" type="checkbox"/> Securitisation - Rating Based Approach	
<input checked="" type="checkbox"/> Securitisation - Internal Assessment Approach	
<input checked="" type="checkbox"/> Securitisation - Supervisory Formula Approach	
<input checked="" type="checkbox"/> Securitisation - Internal Rating Based Approach	

7. For Capital Calculation Run, click  to select the relevant sub approaches, shown in the following figure:

Credit Risk	
Basel II Approaches	
<input type="checkbox"/> Non Securitisation Standardized	
<input type="checkbox"/> Claims on Sovereign	
<input type="checkbox"/> Use ECA Country Scores for risk weighting claims on Sovereigns	<input type="radio"/> Yes <input checked="" type="radio"/> No
<input type="checkbox"/> Claims on PSE	
<input type="checkbox"/> Option used for claims on domestic PSEs	<input checked="" type="radio"/> Option I <input type="radio"/> Option II
<input type="checkbox"/> Claims on Bank	
<input type="checkbox"/> Option for risk-weighting claims on Banks	<input checked="" type="radio"/> Option I <input type="radio"/> Option II
<input type="checkbox"/> Claims on Corporates	
<input type="checkbox"/> Supervisor permission to risk weight all corporate claims at 100% without regard to external rating	<input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="checkbox"/> Claims Secured by Commercial Real Estate	
<input type="checkbox"/> Has the national supervisor permitted a lower RW for certain commercial real estate exposures?	<input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="checkbox"/> Past Due	
<input type="checkbox"/> Past due treatment for non-past due loans to counterparties subject to a 150% RW	<input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="checkbox"/> Use of 0% RW for Gold Bullion held in own vaults or on allocated basis	<input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="checkbox"/> Use of borrower's domestic currency rating for exposure in foreign exchange transactions when loans extended to certain MDBs	<input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="checkbox"/> SFT	
<input type="checkbox"/> Simple Approach	
<input type="checkbox"/> IMM	

8. For Capital Calculation Run select (✓) a portfolio that you want to map to an approach or sub-approach, shown in the following figure:

For Single Counterparty Run, select (✓) a portfolio that you want to map to Single Counterparty Approach.

<input type="checkbox"/> Non Securitisation IRB		✓
<input type="checkbox"/> Equity		
<input type="checkbox"/> Equity Exposures - Non-Investment Funds		
<input checked="" type="radio"/> IMM Approach <input type="radio"/> Simple Risk Weight Approach		
<input type="checkbox"/> Equity Exposures - Investment Funds (In conjunction with Money Market Fund Approach)		
<input checked="" type="radio"/> Simple Modified Look Through Approach <input type="radio"/> Alternate Modified Look Through Approach <input type="radio"/> Full Look Through Approach		
<input type="checkbox"/> SFT		
<input type="radio"/> Collateral Haircut Approach <input checked="" type="radio"/> Internal Model Method <input type="radio"/> VaR Models Approach		
<input type="checkbox"/> Haircut		
<input checked="" type="radio"/> Supervisory Haircut <input type="radio"/> Own Estimate		
<input type="checkbox"/> OTC		
<input type="radio"/> Current Exposure Method <input checked="" type="radio"/> Internal Model Method		
<input type="checkbox"/> CRM		
<input type="checkbox"/> Credit derivatives and guarantees		
<input checked="" type="radio"/> PD Substitution Approach <input type="radio"/> LGD Adjustment Approach		
<input type="checkbox"/> SFT Collateral		
<input checked="" type="radio"/> Comprehensive Approach <input type="radio"/> LGD Adjustment Approach		
<input type="checkbox"/> OTC Collateral		
<input type="radio"/> Comprehensive Approach <input checked="" type="radio"/> LGD Adjustment Approach		

**Figure 1: Portfolio Mapping**

9. Click **Save** after defining the Approaches, Sub-Approaches and Portfolios for each risk type.

You have successfully created a Run.









### Run Execution

To access the Run Execution Screen:

1. Click **Risk Applications** on the Left Hand Side pane of the OFSAAI Screen.
2. Click **Basel Regulatory Capital**.
3. Click **Run Execution** on the LHS Pane. The Run Summary Screen is displayed, wherein you can define and execute Runs.

### Run Execution UI Icons

The following table aims to familiarize you with the common icons available in the Run Management UI:

Buttons Name	Icon	Description
Pagination Options		Helps in navigating from one page to another
View		Helps to view details of a particular Run
Run Default Parameters		Click this icon to allow you to update the Run Default Parameters
Run Execution Parameters		Click this icon to allow you to update the Run Execution Parameters
Add		Helps in adding a hierarchy
Run Execution		Helps in viewing the Run Execution details
Copy		Click this icon to display the Run Execution Parameters screen to modify or create a batch
Search		This icon helps in searching a particular Run. Type the Run Name in the <b>Run Name</b> Text Box and click this icon.





Buttons Name	Icon	Description
Reset		The Reset icon refreshes the Run Name and Run Type field back to the default blank fields.
Execute		Click to execute a Run

Table 1: Run Execution UI Icons

## 5.2.4 Run Management Summary

Run Management Summary displays the list of runs defined in the Rules Framework except those with Immediate Execution Option **Yes** in the grid. It provides the following details of the run:




- **Run name**
- **Run Type**
- **Created By**
- **Creation Date**
- **Modification By**
- **Modification Date**

The Search Panel has a provision to search based on segment, Run name, and Run type.




Run Name	Run Type	Created By	Created Date	Last Modified By	Last Modified Date
Capital Calculation - BIS Foundation RB Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	11/23/2012
Capital Calculation - BIS Basel I Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	07/26/2012
Staging Data Population - Market Risk - BIS Standardised Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	06/26/2012
Risk Weighted Asset Calculation - Market Risk - BIS Standardised Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	06/26/2012
Risk Weighted Asset Calculation - Credit Risk - BIS Basel I Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	06/26/2012
Risk Weighted Asset Calculation - Operational Risk - BIS Alternate Standardised Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	06/26/2012
Risk Weighted Asset Calculation - Operational Risk - BIS Standardised Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	06/26/2012
Risk Weighted Asset Calculation - Operational Risk - BIS Basic Indicator Approach	BASELINE RUN	SYSADMIN	06/26/2012	SYSADMIN	06/26/2012

You can see the complete list of runs with the help of pagination by navigating from one

page to another by clicking the  (Next)  (Previous) icons, by clicking the  (No Records) to be viewed per page or by providing the input for the number of records to be displayed per page or on the bar.

You can also sort the records to view it in convenient way.

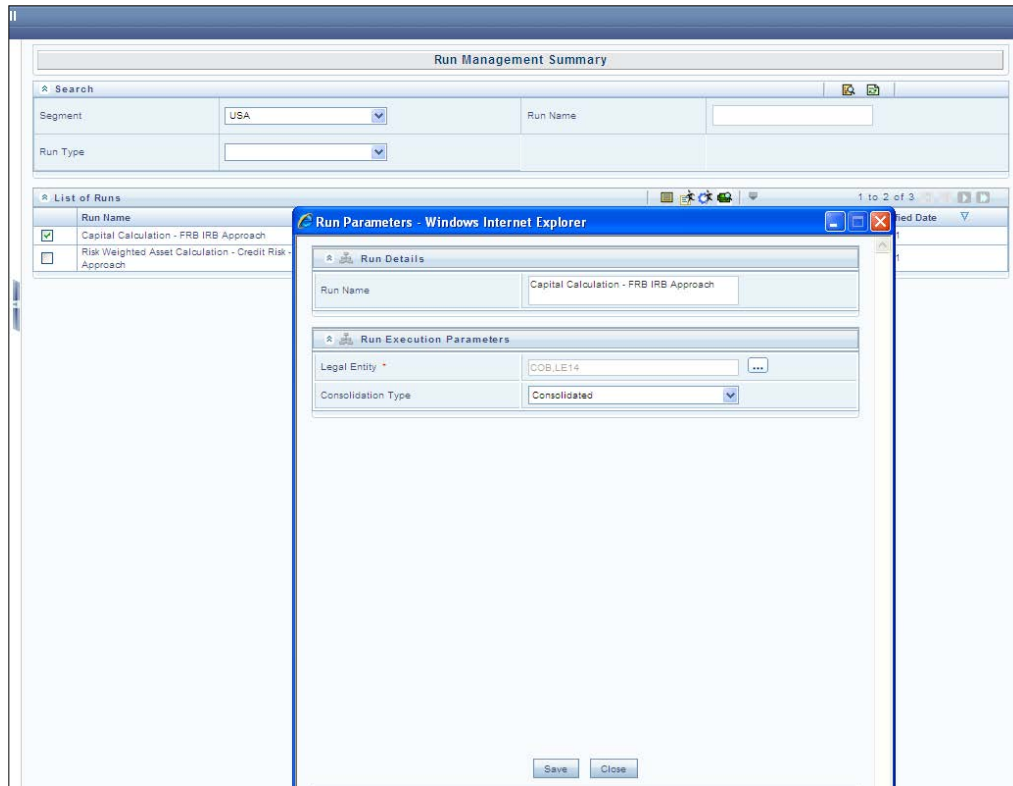
## Run Default Parameters

Run Default Parameter allows you to enter and save the Run level parameters. To input the run level parameters select the checkbox corresponding to that Run and click  icon on the navigation bar. Run Parameters screen is displayed where you can view and input Run level parameters related to that Run. You are allowed to add or modify the parameter values and store the same.

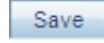
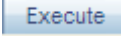

**NOTE:** To modify or view the parameters the Modify Run Parameters role should be mapped to your user profile.

The following parameters are to be updated:

- **Legal Entity** –The accounts of the selected Legal entity and its child entity (depending on the consolidation type selected) is processed to calculate provision. Parent-child relationship between Legal Entity will be as defined in DIM\_ORG\_STRUCTURE table.
- **Consolidation Type** – This field is read in conjunction with Legal Entity field. It is a dropdown box and the value could be **Solo** or **Consolidation**. Select **Solo** if you want to process direct accounts of the Legal entity and not that of its child entities. Select **Consolidation** if you want to process all the accounts under the Legal Entity and its child entities. In case of Consolidation all intra-group exposures are excluded.
- **Reporting Currency** – The currency can be selected from Run Parameters screen. All amounts in the Run are converted to the selected Reporting Currency.



## Run Execution Parameters

In addition to the Run Default parameters, **Run Execution Parameter** screen allows you to enter and save the Run execution parameters. By clicking the  icon a batch with the entered Run execution parameters is created. The batch created can be executed by clicking  button. To input the Run Execution Parameters select the check box corresponding to that run and click the  button on the navigation bar.

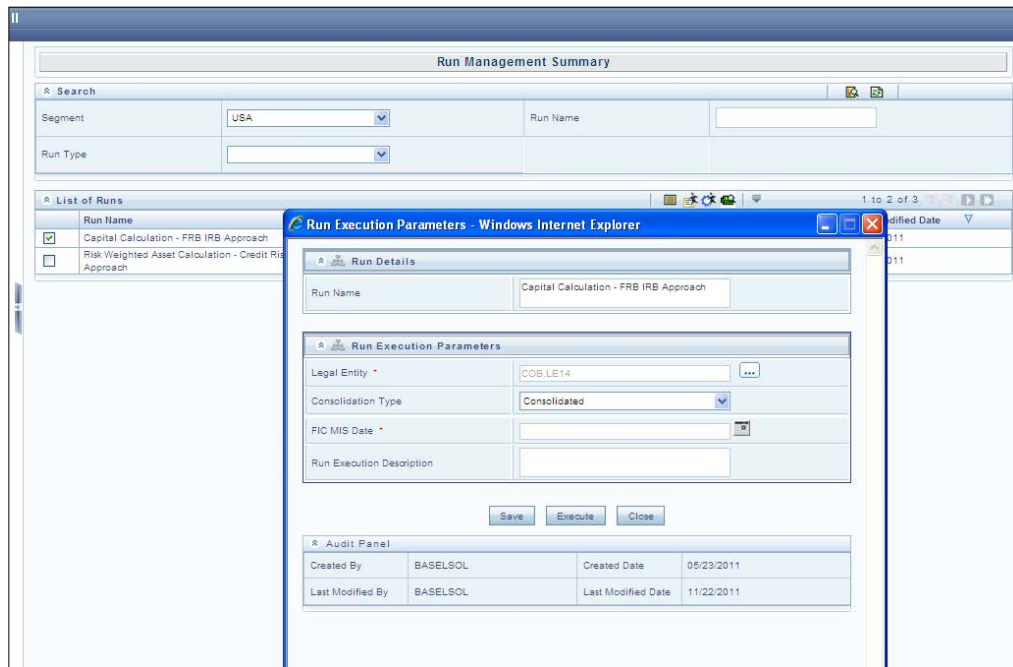
**NOTE:** To execute a Run, the *execute run* role should be mapped to your user profile.

In the **Run Execution Type** section, you can select **Yes** if you want the Portfolio to participate in the execution. The following Run execution parameters are to be updated:


- **Legal Entity:** Default Legal Entity set for the run (*as mentioned in Default Parameters for Run*) can be changed for the specific execution. The accounts of the selected Legal entity and its child entity

(depending on the consolidation type selected) are processed to calculate provision. Parent-child relationship between Legal entities will be as defined in DIM\_ORG\_STRUCTURE table.

- **Consolidation Type:** Default Consolidation Type set for the run (*as mentioned in Default Parameters for Run*) can be changed for the specific execution. This field is read in conjunction with Legal Entity field. It is a dropdown box and the value could be **Solo** or **Consolidation**. Select **Solo** if you want to process direct accounts of the Legal entity and not that of its child entities. Select **Consolidation** if you want to process all the accounts under the Legal Entity and its child entities. In case of **Consolidation** all intra-group exposures are excluded.
- **Reporting Currency:** The currency for a particular execution can be selected from Run Execution Parameters screen. All amounts will be converted to the selected Reporting Currency.
- **FIC\_MIS\_DATE:** Date as-on which data should be picked and processed.
- **Run Execution Description:** This is to describe a run in detail. It is an optional parameter.



## Run Execution Summary

Selecting a Run from the Run Management screen and clicking the  icon displays the **Run Execution Summary** screen where the following sections are displayed.

- **Run Details**
- **Run Execution Details**

The Run details, displays the following details:

- **Run Name**
- **Run Type**
- **Run ID**

The **Run Execution Details**, displays the following details:



- **Run Skey**

- **Run Execution Id**
- **FIC MIS DATE**
- **Execution Status**
- **Execution Date**
- **Time of Execution**

Run Execution Summary						
Run Name	Capital Calculation - FRB IRB App		Run ID	1306182237482		
Run Type	BASELINE RUN					
Run Execution Details						
Run Key	Run Execution Id	FIC MIS DATE	Execution Status	Execution Date	Time of Execution	
<input type="checkbox"/>	103	RQEXE018	10/20/2011	ONGOING	11/25/2011	17:22:31

**Figure 2: Run Execution Summary Screen**

Click the checkbox against Run Execution Id for the following:


- View Parameter details
  - Clicking the  icon displays the parameter details like Run Execution Parameter Detail.
- Copy
  - Clicking  icon to display the **Run Execution Parameter** screen with the parameters populated as the selected execution and you can modify or can create a batch and execute the same.

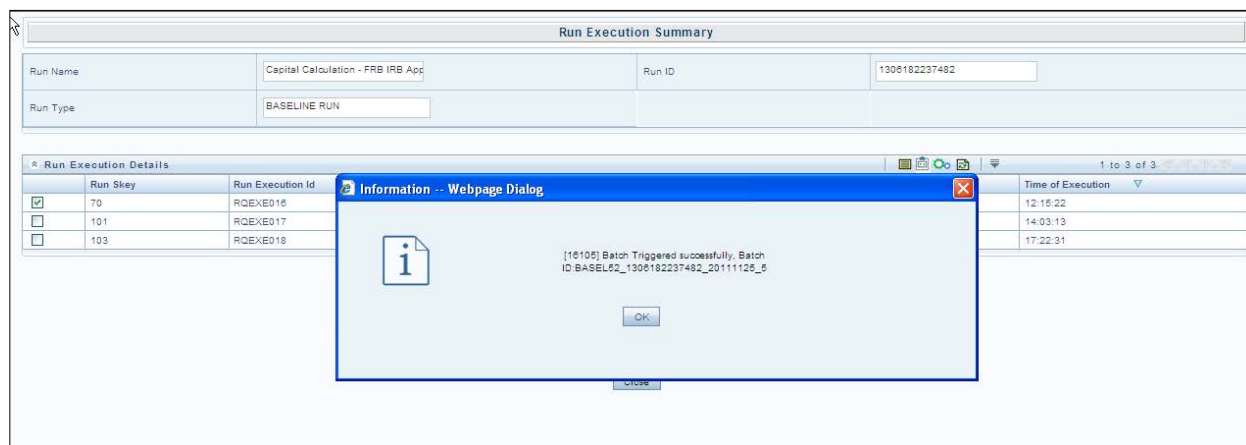
Run Execution Summary						
Run Name	Capital Calculation - FRB IRB App		Run ID	1306182237482		
Run Type	BASELINE RUN					
Run Execution Details						
Run Key	Run Execution Id	FIC MIS DATE	Execution Status	Execution Date	Time of Execution	
<input checked="" type="checkbox"/>	103	RQEXE018				

Run Execution Parameters - Windows Internet Explorer			
Run Details			
Run Name	Capital Calculation - FRB IRB Approach		
Run Execution Parameters			
Legal Entity *	COB_LE14	...	
Consolidation Type	Consolidated	v	
FIC MIS Date *		...	
Run Execution Description			
<input type="button" value="Save"/> <input type="button" value="Execute"/> <input type="button" value="Close"/>			
Audit Panel			
Created By	BASELSOL	Created Date	05/23/2011
Last Modified By	BASELSOL	Last Modified Date	11/22/2011

- Execute

- Clicking  icon triggers the batch which has been created from the **Run Execution Parameter** screen and the status of the triggered batch is displayed. In the execution summary screen multiple selections of the execution ids is available to trigger a batch.



### 5.2.5 Run Management Maintenance

You also have the option of modifying the various parameters in Run Management. These parameters can be modified in the Run Management Setup tables. The relevant Run Management Setup tables configured in the Basel application are as follows:

- RM\_SETUP\_SEG\_REGULATION\_MAP:** This table contains the list of regulations mapped to each segment.

Primary key-->V\_SEGMENT\_CODE, V\_REGULATION

Column	Indicative values
V_SEGMENT_CODE	Contains the segment Code
V_REGULATION	Contains the regulation mapped to the segment

To add a new regulation under a particular segment an entry needs to be done in the **RM\_SETUP\_SEG\_REGULATION\_MAP** table.

- RM\_SETUP\_APPROACH\_MASTER:** This table contains the list of approaches used.

Primary key--> N\_APPROACH\_KEY, V\_SEGMENT\_CODE

Column	Indicative values
N_APPROACH_KEY	Contains a unique key for each Approach
V_SEGMENT_CODE	Contains the segment Code
V_RISK_TYPE	Contains the risk type (for example 'CR','MR')
V_APPROACH_ID	Contains a unique text identifier for each approach
V_APPROACH_DESC	Contains the description of the approaches used
V_APPROACH_ENABLED	Is a flag to identify if the approach is enabled
N_GROUP_ID	A unique number for each risk type
F_IS_ADDED_BY_DEFAULT	Value is set to 'Y' if this process is used in all executions.(for example 'Capital Consolidation' and 'Credit Rating Population' are used it all runs)

V_REGULATION	Contains the regulation to which the approach is mapped.
--------------	--

- **RM\_SETUP\_APPROACH\_DETAIL:** Contains the Run Management questions and answers for each approach.

Primary key --> V\_OPTION\_ID, V\_SEGMENT\_CODE

Column	Indicative values
N_APPROACH_KEY	Contains a unique key for each Approach from RM_SETUP_APPROACH_MASTER
V_OPTION_ID	Unique key text identifier for each RM Question and answer(The same option ids can be repeated for multiple segments)
V_OPTION_DESC	The Run Management Questions and answers(The same question and answer can be repeated for multiple segments)
V_OPTION_TYPE	The value in this field is 'TEXT' for the questions, 'OPTS' for the check boxes and 'RADIO' for the radio buttons
V_PARENT_OPTION_ID	Contains the id of the parent question
F_ENABLED_IND	Is a flag to identify if the option is enabled
F_IS_DEFAULT_VALUE	Is a flag to identify whether the flag is a default value or not
F_IS_CRM	This flag is used to identify the options that are to be disabled when CRM is not selected in the UI
V_RUN_PARAMETER_COLUMN	Contains the name of the 'RUN_PARAMETERS' column to which the particular option is related to. The value of the child to this option is stored in the 'RUN_PARAMETERS' column
V_OPTION_DEPENDENCY	Contains a coma separated list of ids which if selected should disable this Question
V_REGULATION	Contains the regulation to which the approach is mapped.
V_SEGMENT	Contains the segment Code

- **RM\_SETUP\_PROCESS\_DETAILS:** Contains the processes and sub processes related to each run management answer. There can be multiple sub processes mapped to each option id segment code combination.

Primary key --> N\_OPTION\_ID,V\_SEGMENT\_CODE,V\_SUB\_PROCESS

Column	Indicative values
V_SEGMENT_CODE	Contains the segment Code
V_RISK_TYPE	Contains the risk type (for example 'CR','MR' etc)
V_APPROACH	Contains a unique text identifier for each approach
V_APPROACH_DESC	Contains the description of the approaches used
N_OPTION_ID	Contains the run management answers id
V_SUB_PROCESS	Contains the names of the processes and the sub processes
N_APPROACH_KEY	Contains a unique key for each Approach
F_MASTER_PROCESS	This flag is 'Y' for the processes and is null for the sub processes
N_SUB_SORT_ORDER	It contains the order of processes when there is more than one process for an option id
V_REGULATION	Contains the regulation to which the process is mapped.

- **Run\_Parameter\_Details** table: This tables contains details of the Run Parameters

Column	Indicative Values
V_SEGMENT_CODE	Stores the segment codes

Column	Indicative Values
V_PARAM_ID	Stores the parameter id of the parameters used in the default parameter screen
V_PARAM_DESC	Stores the description of the parameters
V_PARAM_TYPE	Stores the information on the parameter type. The type can be HIER for Hierarchy, LIST for dropdown, TEXT for input, RADIO for radio button, CALENDAR for calendar
F_IS_MANDATORY	Stores the information whether the parameter is mandatory or not
N_DISPLAY_ORDER	Specifies the order in which the parameters need to appear in the screen
F_IS_DEFAULT_PARAM	Specifies if the parameter is default or not
F_NODE_SELECTION	Specifies if the hierarchy selection is single level or multi level
V_RUN_TYPE	Specifies the type of run. BR for Baseline Run, SR for Simulation Run, ST for Stress Run
F_IS_LEBASED	Specifies that the run is LE based

- **Run\_Parameters\_LOV** table: This table contains the details of the run parameters defined in run\_parameters

Column	Indicative Values
V_SEGMENT_CODE	Stores the segment codes
V_PARAM_ID	Stores the parameter id of the parameters used in the default parameter screen
V_PARAM_VALUE_CODE	Stores the code of the list of values to be displayed.
V_PARAM_VALUE_DESC	Stores the description of the list of values to be displayed.
N_DISPLAY_ORDER	Specifies the order in which the parameters need to appear in the screen
V_RUN_TYPE	Specifies the type of Run. BR for Baseline Run, SR for Simulation Run, ST for Stress Run

There are two types of modifications possible in Run Management as follows:

**To add a new answer to an existing question:**

The screenshot shows a configuration window with a tree view. The root node is 'Non Securitisation Standardized'. Under it are several expandable nodes: 'Claims on Sovereign', 'Claims on PSE', 'Claims on Bank', and 'Claims on Corporates'. The 'Claims on PSE' node is expanded, showing two radio button options: 'Option I' (which is selected) and 'Option II' (which is unselected). Other options include 'Use ECA Country Scores for risk weighting claims on Sovereigns', 'Option used for claims on domestic PSEs', and 'Supervisor permission to risk weight all corporate claims at 100% without regard to external rating'.

For example: Under **Claims on PSE** if you want to add Option III, then the new Setup data will be as follows:

Table	Column	Indicative values
RM_SETUP_APPROACH_DETAIL	n_approach_key	Same as 'Claims on domestic PSEs'
RM_SETUP_APPROACH_DETAIL	v_option_id	New Option Id
RM_SETUP_APPROACH_DETAIL	v_option_desc	Option III

Table	Column	Indicative values
RM_SETUP_APPROACH_DETAIL	v_option_type	RADIO
RM_SETUP_APPROACH_DETAIL	v_parent_option_id	v_option_id of 'Option used for claims on domestic PSEs'
RM_SETUP_APPROACH_DETAIL	f_enabled_ind	Y
RM_SETUP_APPROACH_DETAIL	f_is_default_value	NULL
RM_SETUP_APPROACH_DETAIL	f_is_crm	NULL
RM_SETUP_APPROACH_DETAIL	v_run_parameter_column	NULL
RM_SETUP_APPROACH_DETAIL	v_option_dependency	NULL
RM_SETUP_APPROACH_DETAIL	v_segment_code	Same as 'Claims on domestic PSEs'
RM_SETUP_APPROACH_DETAIL	v_regulation	Same as 'Claims on domestic PSEs'

**To add a new question:**

The screenshot shows a configuration window with a tree view. The root node is 'Non Securitisation Standardized'. Under it are 'Claims on Sovereign' and 'Claims on PSE'. 'Claims on Sovereign' has a sub-option 'Use ECA Country Scores for risk weighting claims on Sovereigns' with radio buttons for 'Yes' and 'No' (selected). 'Claims on PSE' has a sub-option 'Option used for claims on domestic PSEs' with radio buttons for 'Option I' (selected) and 'Option II'. 'Claims on Bank' has a sub-option 'Option for risk-weighting claims on IIFS' with radio buttons for 'Option I' (selected) and 'Option II'. 'Claims on Corporates' has a sub-option 'Supervisor permission to risk weight all corporate claims at 100% without regard to external rating' with radio buttons for 'Yes' (selected) and 'No'.

For example: If you want to add a question such as “Are floor risk weights applicable for corporate?” (This question is applicable only if 100% risk weights corporate are not applicable) then the new set up tables will be as follows:

Table	Column	Indicative values
RM_SETUP_APPROACH_DETAIL	n_approach_key	Same as 'Non Securitization Standardized'
RM_SETUP_APPROACH_DETAIL	v_option_id	OPT01
RM_SETUP_APPROACH_DETAIL	v_option_desc	Use floor risk weights for corporate?
RM_SETUP_APPROACH_DETAIL	v_option_type	TEXT
RM_SETUP_APPROACH_DETAIL	v_parent_option_id	v_option_id of 'Claims on Corporates'
RM_SETUP_APPROACH_DETAIL	f_enabled_ind	Y
RM_SETUP_APPROACH_DETAIL	f_is_default_value	Y
RM_SETUP_APPROACH_DETAIL	f_is_crm	
RM_SETUP_APPROACH_DETAIL	v_run_parameter_column	Run parameter column name



Table	Column	Indicative values		
RM_SETUP_APPROACH_DETAIL	v_option_dependency	v_option_id of 'Yes'		
RM_SETUP_APPROACH_DETAIL	v_segment_code	Same as 'Non Securitization Standardized'		
RM_SETUP_APPROACH_DETAIL	v_regulation	Same as 'Non Securitization Standardized'		

## 5.2.6 Run Parameters Setup for Run Creation

If the Run is not created through Run Management UI, the **usr\_defined\_run\_parameters** table needs to be setup manually for the selected options/approaches for a particular regulation and segment. **USER\_DEFINED\_RUN\_PARAMETERS** table has the setup codes for different options. However if you want to add more options, you can add a record (new setup codes with options) by looking up information from **RM\_SETUP\_APPROACH\_DETAIL** - the setup table for options that are displayed on the Run Definition screen. In this table the column names are populated against the questions. Configuration of **RM\_SETUP\_APPROACH\_DETAILS** is explained in [Run Management Maintenance](#) section. The column names and values that need to be updated for the selected option are given in the below table:

### Regulation: Basel

### Segment: IFSB

Approach Hierarchy	Selected Option	run_parameters column name	run_parameters column value
Non Securitization Standardized Claims on Sovereign Use ECA Country Scores for risk weighting claims on Sovereign	Yes	v_nss_eca_for_ownership	OPT0004
	No		OPT0005
Non Securitization Standardized Claims on PSE Option used for claims on domestic PSEs	Option I	v_nss_rw_option_dpse	OPT0008
	Option II		OPT0008
Non Securitization Standardized Claims on Bank Option for risk-weighting claims on IIFS	Option I	v_nss_rw_option_bank	OPT0012
	Option II		OPT0013
Non Securitization Standardized Claims on Corporate Supervisor permission to risk weight all corporate claims at 100% without regard to External	Yes	v_nss_100pct_rw_corp	OPT0016
	No		OPT0017
Non Securitization Standardized Equity Exposures In Banking Book Option for risk-weighting Equity Exposures In Banking Book	Simple Risk Weight Method	v_nss_equity_approach	OPT0034
	Slotting Method		OPT0035
Non Securitization Standardized CRM Approach for Banking Book	Collateral Simple Approach	V_CRM_METHOD	OPT0053
	Collateral Comprehensive Approach		OPT0054
Non Securitization Standardized Haircut	Supervisory Haircut	v_ns_haircut_method	OPT0056
	Own Estimate		OPT0057
Securitization Standardized	N/A	v_sec_approach	OPT0500
Standardized Approach Commodity Risk	Commodity Risk	v_mrs_commodity_risk_method	OPT1008

Approach Hierarchy	Selected Option	run_parameters column name	run_parameters column value
	Maturity Ladder Approach		OPT1009

**Segment: CBRC**

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
Standardized Approach o Interest Rate Risk	General Market Risk-Duration Method	v_mrs_interest_rate_method	OPT1003
	General Market Risk-Maturity Method		OPT1004
Standardized Approach o Commodity Risk	Simplified Approach	v_mrs_commodity_risk_method	OPT1008
	Maturity Ladder Approach		OPT1009
Standardized Approach o Options	Simplified Approach	v_mrs_options_method	OPT1013
	Delta Plus Approach		OPT1014

**Segment: INDIA**

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETER S column value
Non Securitization Standardized o SFT	Simple Approach	v_ns_sft_method	OPT0037
Non Securitization Standardized o OTC	CEM	v_ns_otc_method	OPT0041
Non Securitization Standardized o Haircut	Supervisory Haircut	v_ns_haircut_method	OPT0056
Securitization Standardized	N/A	v_sec_approach	OPT00500
Standardized Approach o Interest Rate Risk	General Market Risk-Duration Method	v_mrs_interest_rate_method	OPT1003
Standardized Approach o Options	Simplified Approach	v_mrs_options_method	OPT1013
	Delta Plus Approach		OPT1014

**Segment: BRAZIL**

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
Non Securitization o CRM Approach for Banking Book	Collateral Simple Approach	v_crm_method	OPT0053

**Regulation: Basel II**

**Segment: BIS**

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
Non Securitization Standardized	Yes		OPT0004

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
○Claims on Sovereign Use ECA Country Scores for risk weighting claims on Sovereign	No	v_nss_eca_for_soverign	OPT0005
Non Securitization Standardized ○Claims on PSE Option used for claims on domestic PSEs	Option I	v_nss_rw_option_dpse	OPT0008
	Option II		OPT0009
Non Securitization Standardized ○Claims on Bank Option for risk-weighting claims on Banks	Option I	v_nss_rw_option_bank	OPT0012
	Option II		OPT0013
Non Securitization Standardized ○Claims on Corporates Supervisor permission to risk weight all corporate claims at 100% without regard to external rating	Yes	v_nss_100pct_rw_corp	OPT0016
	No		OPT0017
Non Securitization Standardized ○Claims Secured by Commercial Real Estate Has the national supervisor permitted a lower RW for certain commercial real estate	Yes	v_nss_lower_rw_cre	OPT0020
	No		OPT0021
Non Securitization Standardized ○Past Due Past due treatment for non-past due loans to counterparties subject to a 150% RW	Yes	v_nss_pastdue_for_nonpastdue	OPT0024
	No		OPT0025
Non Securitization Standardized ○Use of 0% RW for Gold Bullion held in own vaults or on allocated basis	Yes	v_nss_0_rw_for_gold	OPT0027
	No		OPT0028
Non Securitization Standardized ○Use of borrower's domestic currency rating for exposure in foreign exchange transactions	Yes	v_nss_borrower_ccy_rat_mdb	OPT0030
	No		OPT0031
Non Securitization Standardized ○SFT	Simple Approach	v_ns_sft_method	OPT0037
	IMM		OPT0038
	VaR Model		OPT0039
Non Securitization Standardized ○OTC	CEM	v_ns_otc_method	OPT0041
	IMM		OPT0042
	Standard Approach		OPT0043
Non Securitization Standardized ○Long Settlement Transactions	CEM	v_ns_lst_approach	OPT0045
	IMM		OPT0046
	Standard Approach		OPT0047
Non Securitization Standardized ○Haircut	Supervisory Haircut	v_ns_haircut_method	OPT0056
	Own Estimate		OPT0057
Securitization Standardized	N/A	v_sec_approach	OPT0500
Securitization - Supervisory Formula Approach ○Usage of Simplified Method for computing N and LGD	Yes	V_SSF_SIMPLE_N_LGD	OPT0611
	No		OPT0612
Standardized Approach ○Interest Rate Risk	General Market Risk-Duration Method	v_mrs_interest_rate_method	OPT1003
	General Market Risk-Maturity Method		OPT1004

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
Standardized Approach ○Commodity Risk	Simplified Approach	v_mrs_commodity_risk_method	OPT1008
	Maturity Ladder Approach		OPT1009
Standardized Approach ○Options	Simplified Approach	v_mrs_options_method	OPT1013
	Delta Plus Approach		OPT1014

**Regulation: Basel III**

**Segment: BIS**

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
Non Securitization Standardized ○Claims on Sovereign Use ECA Country Scores for risk weighting claims on Sovereign	Yes	v_nss_eca_for_sovereign	OPT0004
	No		OPT0005
Non Securitization Standardized ○Claims on PSE Option used for claims on domestic PSEs	Option I	v_nss_rw_option_dpse	OPT0008
	Option II		OPT0009
Non Securitization Standardized ○Claims on Bank Option for risk-weighting claims on Banks	Option I	v_nss_rw_option_bank	OPT0012
	Option II		OPT0013
Non Securitization Standardized ○Claims on Corporates Supervisor permission to risk weight all corporate claims at 100% without regard to external rating	Yes	v_nss_100pct_rw_corp	OPT0016
	No		OPT0017
Non Securitization Standardized ○Claims Secured by Commercial Real Estate Has the national supervisor permitted a lower RW for certain commercial real estate	Yes	v_nss_lower_rw_cre	OPT0020
	No		OPT0021
Non Securitization Standardized ○Past Due Past due treatment for non-past due loans to counterparties subject to a 150% RW	Yes	v_nss_pastdue_for_nonpastdue	OPT0024
	No		OPT0025
Non Securitization Standardized ○Use of 0% RW for Gold Bullion held in own vaults or on allocated basis	Yes	v_nss_0_rw_for_gold	OPT0027
	No		OPT0028
Non Securitization Standardized ○Use of borrower's domestic currency rating for exposure in foreign exchange transactions	Yes	v_nss_borrower_ccy_rat_mdb	OPT0030
	No		OPT0031
Non Securitization Standardized ○SFT	Simple Approach	v_ns_sft_method	OPT0037

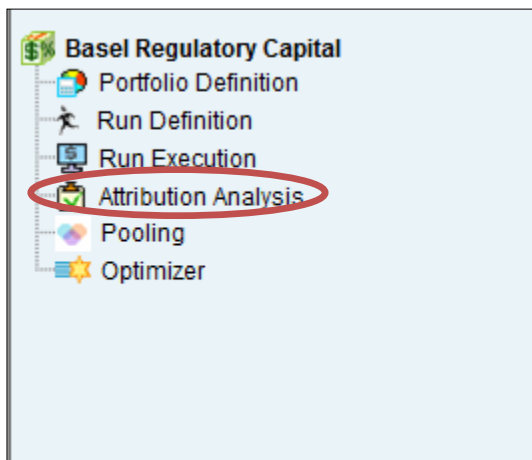
Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
	IMM		OPT0038
	VaR Model		OPT0039
Non Securitization Standardized oOTC	CEM	v_ns_otc_method	OPT0041
	IMM		OPT0042
	Standard Approach		OPT0043
Non Securitization Standardized oLong Settlement Transactions	CEM	v_ns_lst_approach	OPT0045
	IMM		OPT0046
	Standard Approach		OPT0047
Non Securitization Standardized oHaircut	Supervisory Haircut	v_ns_haircut_method	OPT0056
	Own Estimate		OPT0057
Non Securitization Standardized oCredit Value Adjustments CVA Standardized Approach	N/A	V_CVA_METHOD	OPT0060
Non Securitization Standardized oCredit Value Adjustments CVA Standardized Approach Include SFTs for CVA calculation	Yes	V_CVA_INCLUDE_SFT	OPT0062
	No		OPT0063
Non Securitization Standardized oCredit Value Adjustments CVA Standardized Approach CDS Index Needs to be decomposed	Yes	V_CVA_CDS_INDEX_DECOMPOSITION	OPT0065
	No		OPT0066
Securitization Standardized	N/A	v_sec_approach	OPT0500
Securitization - Supervisory Formula Approach oUsage of Simplified Method for computing N and LGD	Yes	V_SSF_SIMPLE_N_LGD	OPT0611
	No		OPT0612
Standardized Approach oInterest Rate Risk	General Market Risk-Duration Method	v_mrs_interest_rate_method	OPT1003
	General Market Risk-Maturity Method		OPT1004
Standardized Approach oCommodity Risk	Simplified Approach	v_mrs_commodity_risk_method	OPT1008
	Maturity Ladder Approach		OPT1009
Standardized Approach oOptions	Simplified Approach	v_mrs_options_method	OPT1013

Approach Hierarchy	Selected Option	RUN_PARAMETERS column name	RUN_PARAMETERS column value
	Delta Plus Approach		OPT1014

### 5.3 Attribution Analysis GUI


To perform Attribution Analysis follow the steps given below to access the Attribution Analysis screen:

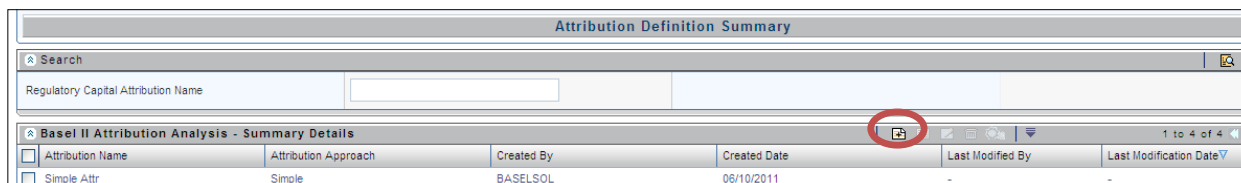
1. Click **Basel Regulatory Capital** on the Left Hand Side Pane of the OFSAAL.
2. Click **Attribution Analysis**, shown in the following figure:



**NOTE:** It is assumed that all the Basel Runs are executed before performing Attribution Analysis.

Follow the steps given below to perform Attribution Analysis:

1. Click  to define an attribution approach to be executed, in the Attribution Analysis Summary Screen as shown in the following figure:



The Attribution Analysis Definition Screen is displayed as follows:

**Basel Regulatory Capital Attribution Analysis Definition**

**^ Details**

Name\*

Description\*

**^ Target Variable(s)**

Capital

Credit Risk Weighted Assets

**^ Approach Selection**

Simplified Approach  Advanced Approach

**Control Variables**

- Business Growth
- Exchange Rate Change
- Risk Weight (RW) Migration

**Control Variables**

- Existing Exposures
  - Exchange Rate Change
  - Risk Weight (RW) Migration
    - Pre-CRM RW Migration
      - PD Migration
      - LGD Migration
      - M Migration
    - Residual Factor
  - CRM Impact Migration
  - Exposure at Default Migration
  - Exposure Matured
  - New Exposures

**^ Treatment of Multiplication Factor**

Attribution to Multiplication Factor

Market Risk Weighted Assets


Operational Risk Weighted Assets

2. Enter **Name** and **Description** of the Attribution Approach.
3. Select **Yes** if you want to compute Attribution Analysis for Capital (Eligible Capital) or else select **No**
4. Select **Yes** if you want to include Attribution Analysis for Credit Risk Weighted Assets or else select **No**.
5. Click  to include Simplified Approach.
6. Select **Yes** if you want to include the Multiplication factor variable in the computation or else select **No**.
7. Select **Yes** to include Market RWA computation or else select **No**.
8. Select **Yes** to include Operational **RWA** computation or else select **No**.
9. Click  .


The newly defined Attribution Analysis computation appears in the **Attribution Definition Summary** screen. To execute Attribution Analysis, refer to the following steps:



1. Click  to select the relevant approach shown in the following figure:


Attribution Definition Summary						
Search						
Regulatory Capital Attribution Name						
Basel II Attribution Analysis - Summary Details						
<input type="checkbox"/>	Attribution Name	Attribution Approach	Created By	Created Date	Last Modified By	Last Modification Date
<input type="checkbox"/>	Mix Appr	Advanced	BASELSOL	01/24/2011	-	-
<input type="checkbox"/>	Simple Final	Simple	BASELSOL	01/21/2011	-	-
<input checked="" type="checkbox"/>	Advance Final	Advanced	BASELSOL	01/21/2011	-	-


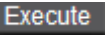
- Click  to define the variables for Analysis in the Attribution Definition Summary screen.

The following figure represents the Attribution Analysis- Execution screen.

Basel Regulatory Capital Attribution Analysis - Execution	
Attribution Definition	
Name	Description
Execution Details	
Execution Description*	
Select MIS Date*	
Select Run ID*	
Period*	<input checked="" type="radio"/> Monthly <input type="radio"/> Quarterly <input type="radio"/> Half_Yearly <input type="radio"/> Yearly <input type="radio"/> Custom
Select Previous MIS Date*	
Select Previous Run ID*	
Approach/Rule Changes	No
<input type="button" value="Execute"/> <input type="button" value="Schedule for Execution"/> <input type="button" value="Cancel"/>	

- Enter a description in the Executive Description field.
- Click  to select the MIS date of the latest Basel Run in **Select MIS date** field.
- Select the relevant Run from the dropdown list in **Select Run ID** field.
- Click  to select the period of analysis.

**NOTE:** If monthly, quarterly, half yearly or yearly is selected, the **previous MIS date** field is auto populated accordingly. If custom is selected, then click  to select the previous MIS date.

- Select the relevant Run from the **Previous Run ID** field list.
- Select No in the Approach/Rule changes field if there are no changes in the rules for previous MIS date run, shown in the following figure or else follow the step 10.
- Select the Previous Run ID (executed for previous MIS date) and Previous MIS Date modified Run.
- Select  to schedule the execution for a particular date or else select .

The application performs the analysis to quantify the change in CAR based on the approach selected. The Attribution Analysis reports and dashboards are generated in the Basel Regulatory Capital Analytics which



has to be licensed by the bank additionally.

## 5.4 Reporting

Oracle Financial Services Basel Regulatory Capital Analytics Release 6.0.0.0.0 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 *Pillar III* reports covering all market disclosure requirements of the Basel Accord (*Risk-Capital Standards-Advanced Capital Adequacy Framework*).

It also provides pre-configured reports covering all market disclosure requirements of the Islamic Banking Jurisdiction as prescribed by the Islamic Financial Services Board (IFSB) as well as the requirements prescribed by the China Banking Regulatory Commission (CBRC). Basel Regulatory Reports for individual jurisdictions such as Federal Financial Institutions Examination Council 101 (FFIEC 101) in the USA and Swiss Financial Market Supervisory Authority (FINMA) for Switzerland. The reports and dashboards can be generated at various levels (solo or consolidated) and downloaded in various formats including .XLS. Basel Analytics additionally provides the built-in capability to produce *pixel-perfect*. Hence, Basel Analytics can serve as a single regulatory and management reporting application, meeting all Basel disclosure, IFSB disclosures and reporting requirements.

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

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**NOTE:** Oracle Financial Services Basel Regulatory Capital Analytics needs to be licensed by the Bank separately

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## **Annexure A: Generating Download Specifications**

Data Model for Basel Regulatory Capital Basic is available on customer request as an ERwin file.

Download Specifications can be extracted from this model. Refer the whitepaper present in [OTN](#) for more details.

## Annexure B: Frequently Asked Questions

This section addresses some of the frequently asked questions which are as follows:

### Leverage Ratio

**Question 1. 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 provided 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 should add up to the Total Exposure Measure calculation for Leverage Ratio.

**Question 2. Can we execute the Leverage Ratio if the application is implemented 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.

**Question 3. 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.

**Question 4. 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 will not be affected with such changes.

### Capital Buffers

**Question 5. 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.

**Question 6. 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.

**Question 7. 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 and 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 has been 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 priority. The Capital Conservation Ratio in case of shortfall is also calculated at an aggregate level and not at individual buffer level.

**Question 8. 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 should be used as input data which in turn is used for further calculations.

**Question 9. If one of the exposure countries has not implemented Basel III and the country's regulator have not recommended any buffer, should 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 would depend on the buffer requirement required for all the exposure countries by the parent regulator. By default, the buffer requirement specified by parent regulator for each exposure country is included in the input data. Therefore, data is not required to be modified.

**Question 10. As per Basel requirements, all three buffers are calculated from CET1. However, in the future as per guidelines of 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 buffer 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.

### **Credit Valuation Adjustment**

**Question 11. How will the application handle Index Decomposition, if data for index is not provided and index decomposition is selected?**

In this case, the application will calculate CVA charge without decomposition. The Run can be successfully executed and Index Hedge position will be treated with decomposition.

**Question 12. How does the application handle an Index Hedge position marked to 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 counterparty is used only to allocate CVA charge to counterparty while using standardized approach for CVA Calculation.

**Question 13. 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.

**Question 14. 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 the Rule.

**Question 15. 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.

**Question 16. 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.

**Operational Risk**

**Question 17. 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 parameter 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. Data Model can undergo changes if the newly added parameter is not captured. The data model changes affect the staging table as well as the processing table.

**Question 18. Can reclassification rule for mapping of internal line of business to standard line of business be modified?**

Yes, you can change Reclassification Rule as per jurisdiction requirement. You need to add the mapping in the Rule **OR Internal LoB to Standard LoB Reclassification** as well as make an entry into **dim\_lob** and **dim\_standard\_lob**.

**Capital Structure (Basel III)**

**Question 19. Are the list of instruments provided for each component of Capital i.e., 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.

**Question 20. 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.

**Question 21. 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.

**Question 22. 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 to be risk-weighted with some different percentage.

**Question 23. 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 Risk RWA, and CAP170 for Operational RWA). These values flow into **FCT\_STANDARD\_ACCT\_HEAD** and the respective

processes should be deleted from the Run. For example: if Market risk RWA is available as a download, market risk related processes should be deleted from the Run.

### **US Related Changes: Securitization Simplified Supervisory Formula Approach (SSFA)**

#### **Question 24. How does the application calculate the KG for the Resecuritization pool?**

The application expects the pool information in the pool table, tranche information in the tranche table and the exposure belonging to the resecuritized pool in the exposures table. The exposures belonging to the resecuritized pool are identified based on the Resecuritization flag in the Exposures table. The percentage of the underlying comprising of securitization exposures are captured as a pool attribute.

The non-securitization underlying data for the Resecuritization pool are expected in the Product Processors (for Originators) and in the Underlying exposures table (for Investors). The securitization underlying data for the Resecuritization pool are expected in the Exposures table with an identifier referring the Resecuritization Pool.

For the Securitization underlying, information required for computing the  $K_{SSFA}$  are required as direct download in the exposures table or else the underlying exposures, pool and the tranche information are required in the Underlying Exposures, Pool and Tranche table respectively.

The application computes the capital requirement of each of the non-securitized underlying exposures using the PD-LGD approach. The application then calculates the weighted average capital requirement of these non-securitized underlying and updates the Non-Securitization  $K_G$  for the resecuritized pool.

The application proceeds with the computation of the  $K_{SSFA}$  using all the data available. The application computes the  $K_{SSFA}$  for all the securitized exposures, including the exposures which are the underlying for the resecuritization pool. The application then calculates the weighted average  $K_{SSFA}$  of these securitized exposures and updates the Securitization  $K_G$  for the resecuritized pool.

The application computes the Pool KG for the resecuritized pool using the below formula:

**$(\% \text{ of Securitization Underlying} * \text{Securitization KG}) + ((100\% - \% \text{ of Securitization Underlying}) * \text{Non-Securitization KG})$**

#### **Question 25. What is the data expectancy of the application in the case of Nth to Default Sold Credit Protection records?**

The application expects the Nth to Default Sold Credit Protection data in the Credit Derivatives table and nth to default flag as 'Y'. The tagging of the Sold Protection to the Protected Securitization Pool is expected in the Underlying Exposures table. All the underlying information pertaining to the Protected Pool is expected in the Underlying Exposures table, with the tagging of the Securitization Pool. The Pool details are captured in the Pool table.

For Nth to Default Sold credit protection to resecuritized pool, the application expects the Nth to Default Sold Credit Protection data in the Credit Derivatives table and nth to default flag as 'Y'. The tagging of the Sold Protection to the Protected Securitization Pool is expected in the Underlying Exposures table. All the non-securitized exposure underlying information pertaining to the Protected Pool is expected in the Underlying Exposures table, with the tagging of the Securitization Pool. In case of securitized underlying, the tagging of the securitized exposure with the sold credit protection is expected in the Underlying Exposures table with the Securitized flag as 'Y'. For this securitized underlying, the corresponding exposure details, tranche and pool details are expected in the Sec Exposures table, Tranche table and Pool table respectively.

The application expects the underlying data identifier as 'SCP' in the Underlying Exposures table for all the Sold Credit Protection Underlying data. The tagging is achieved by the use of **V\_EXPOSURE\_ID** and the **V\_PARENT\_EXPOSURE\_ID**. For a securitization pool being provided protection, the **V\_EXPOSURE\_ID** is the Pool ID and the **V\_PARENT\_EXPOSURE\_ID** is the Sold Credit Protection ID. All the underlying of the Securitization Pool has their individual exposures ID as **V\_EXPOSURE\_ID** and the Pool ID as the **V\_PARENT\_EXPOSURE\_ID**.

For securitization underlying in a resecuritization pool, the **V\_EXPOSURE\_ID** is the securitization exposure

ID, the **V\_PARENT\_EXPOSURE\_ID** in the Sold Credit Protection ID and the **F\_SECURITIZED\_FLAG** is 'Y'.

**Question 26. In the case of Investor records, how does the application expect the underlying data?**

The data expectancy of Investor records is similar to that of the nth to default sold credit protection. The underlying data is expected in the Underlying exposure table with the underlying data identifier as 'INV'.

**Question 27. How does the application handle the Investment grade criteria?**

The application assumes that any rating above BB+ is investment grade. This is done using a hierarchy and hence can be configured by you, when there are changes to this definition of investment grade.

**US Related Changes: Single Counterparty Exposure Limit**

**Question 28. How do we include any special counterparty type in the future?**

Any new counterparty type against which the concentration needs to be calculated can be included by modifying the Rule Single Counterparty - Concentration Treatment Eligibility in the US\_SCP\_ENTITY\_DATA\_PROCESSING process. The counterparty for which the Single Counterparty calculations needs to be done should be added to the list of counterparty types in the rule and should be mapped as eligible.

**Question 29. Is CRM process mandatory to calculate the Single Counterparty Credit Risk exposures?**

Credit Risk Mitigation process is not mandatory and is left to the discretion of the bank whether to go for CRM or not. Therefore the application provides with the flexibility to incorporate the CRM process or opt out of it. If the CRM process is to be included, then the application takes into account the eligible mitigants as described above and calculates the Net Credit exposure taking the mitigant value into account. The CRM process can be selected or omitted from the Run Management Screen (for a Run Management related Run) using the User defined Run Parameters Rule (for a User Defined Run). For more information refer to the [User Defined Run Table](#).

**Question 30. Is it possible to change the mitigant allocation order?**

Exposure mitigant allocation order can be modified for future business requirements. This can be done by altering the mitigant allocation DT (Data Transformation). For more information about the Mitigant Allocation process refer to the [Mitigant Allocation Process](#).

**Securitization**

**Question 31. 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, data relevant to the exposures, tranche, pool, rating and mitigant details are expected.

**Question 32. 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 tables as specified below:

- 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 will be based out of the data given in the exposures table.

**Question 33. The Reporting Bank, which 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 as well as 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 cashflows to that tranche and it starts from the value of 1 which is the senior most tranche.
- If the ratings are inferred, 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
- In case the rating cannot be inferred, the unrated exposures are deducted

#### *Supervisory Formula Approach*

- In this case, there is no dependency on the ratings. Hence it will proceed without any difference in the treatment.

**Question 34. The Reporting Bank, which is an Investor in securitization transaction, has been provided protection on its securitization exposure with the help of a 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. Then 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, consider the following case – 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). And the mitigant provided is 7<sup>th</sup> to Default credit derivative. Hence the application will recognize this mitigant only if there are 6 defaults in the basket of exposures (T1 to T10) or else there is an eligible 6<sup>th</sup> 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. Then the application takes the count of all the tranches which are in default. In the below 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 will be allocated the mitigant and all other exposure combinations mapped to this mitigant will become 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
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

**Question 35. 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 will be assigned to the exposures based on the seniority of the exposures. And the mitigants with the least risk weight will be assigned first to the exposures. The following will be the order in which the mitigants will be allocated.

Exposure ID	Mitigant ID
E1	M2

E2	M2
E3	M2
E4	M2
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 the above order and computes the Post-CRM RWA of the exposures..

**Question 36. Does optimizer work on pool-by-pool basis? Can user explicitly mention how many pools to be processed at a time?**

Yes optimizer works on pool-by-pool basis. However, the user can specify the number of pools to be processed at a single fetch in Optimizer\_Config.xml in <PROCESSEDPOLSIZE> tag.

**Question 37. 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 don't satisfy the join/filter condition present in pooling definition they will not get pool IDs. Such records will not be considered for optimizer and covered factor will not be calculated for those exposures.

### Capital Structure (Basel II)

**Question 38. Are the list of Instruments provided for each component of Capital i.e., 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 component of capital is a bare minimum list. You can add or delete as per their definition of Capital in rules – 'Bank Capital Group Components Reclassification' and 'STD to Capital Group Components Reclassification'

**Question 39. 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/deleting any regulatory adjustment line item.

**Question 40. 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 value for RWA in table – STG\_STANDARD\_ACCT\_HEAD against appropriate Standard Account head identifier (CAP169 for Credit RWA, CAP090 for Market Risk RWA and CAP170 for Operational RWA) for entities for which bank don't calculate RWA using our application. These values will flow into FCT\_STANDARD\_ACCT\_HEAD. And respective process should be removed from the run for e.g. if Market risk RWA is available as download, market risk related processes should be removed from the Run.

### Market Risk (Basel II)

**Question 41. Does the Greeks Engine calculate Greeks parameters for all kind of Options?**

Currently Greeks Engine calculates parameters only for normal options. The exotic options are not covered by Greeks Engine.

### **Mitigant Eligibility (Basel III)**

**Question 42. The Reporting Bank have a wholesale exposure, and for that have got a guarantee from an issuer who 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 under the Basel III rule checks for the presence of a rating for this kind of issuer type and since there is a rating available, this mitigant becomes eligible. The application under the Basel II rule checks for the rating to be A- or better and since the rating is below A-, this mitigant become ineligible.

### **Haircut Assignment (Basel III)**

**Question 43. The Reporting Bank has a securitized exposure, and for that have got two financial collateral - a debt instrument from an issuer who 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 will be 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 the multiple assessment and calculates the final current rating. In this case, the first mitigant will be rated A+ and second mitigant will be 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 will be 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 will be 24%.

The application using the Basel II rule checks for 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 will be 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 will be 12%.

**AOCI Opt-Out Option (US Basel III – Standardized Approach)****Question 44. How the treatment of pre-tax values of AFS equity securities and AFS preferred stock/non-preferred stock classified as equity to be configured?**

Perform the following steps:

1. Create a new CAPID (CAP1000) for Pre-tax AFS equity securities in dim\_standard\_acct\_head table.
2. Map the CAP1000 to All Component of Tier 2 Capital in Capital Component Group mapping.
3. Design a rule that will take 45% of the value of Pre-tax AFS equity securities in Gross Tier 2 capital. Define the rule name as  $\zeta$ USA  $\zeta$  US III Pre-tax value of AFS equity securities part of Gross Tier 2  $\zeta$ . AOCI opt-out option – Y Standard acct head - Pre-tax AFS equity securities BP Expression - Pre-tax AFS equity securities \* 0.45
4. Rule (RLBL0649) need to be removed from AOCI calculation process which add Preferred Stock and Non-Preferred Stock into AFS equity securities.
5. Modify the rule RLBL0463 (USA  $\zeta$  US III  $\zeta$  Accumulated Other Comprehensive Income Calculation) where in BP (BPBL0432) add new measure as  $\zeta$ Net Unrealized Gain/Loss on AFS preferred Stock classified as Equity Security  $\zeta$  and  $\zeta$ Net Unrealized Gain/Loss on AFS Non-preferred Stock classified as Equity Security  $\zeta$  add this measure in the expression.

The following are the codes:

- MBL0552 - Net Unrealized Gain/Loss on AFS Non-preferred Stock classified as Equity Security
  - MBL0553 - Net Unrealized Gain/Loss on AFS preferred Stock classified as Equity Security
6. Modify the rule RLBL0650. Add  $\zeta$ Net Unrealized Gain/Loss on AFS preferred Stock classified as Equity Security  $\zeta$  and  $\zeta$ Net Unrealized Gain/Loss on AFS Non-preferred Stock classified as Equity Security  $\zeta$  as a measure into  $\zeta$ BP- CS  $\zeta$  Transition AOCI (BPBL0596)  $\zeta$ .

# Glossary

<b><u>AMA</u></b>	Advanced Measurement Approach
<b><u>ASCII</u></b>	American Standard Code for Information Interchange
<b><u>BCBS</u></b>	Basel Committee on Banking Supervision
<b><u>BIS</u></b>	Bank of International Settlements
<b><u>CAR</u></b>	Capital Adequacy Ratio
<b><u>CCB</u></b>	Capital Conservation Buffer
<b><u>CCF</u></b>	Credit Conversion Factor
<b><u>CCR</u></b>	Counterparty Credit Risk
<b><u>CET1 Ratio</u></b>	Common Equity Tier 1 Ratio
<b><u>CRE</u></b>	Commercial Real Estate
<b><u>CRM</u></b>	Credit Risk Mitigants
<b><u>CVA</u></b>	Credit Valuation Adjustment
<b><u>DeFQ</u></b>	Data entry and Forms Queries
<b><u>EAD</u></b>	Exposure At Default
<b><u>FFIEC</u></b>	Federal Financial Institutions Examination Council
<b><u>FTP</u></b>	File Transfer Protocol
<b><u>GL</u></b>	General Ledger
<b><u>GRC</u></b>	General Risk Charge
<b><u>GUI</u></b>	Graphic User Interface
<b><u>IFSB</u></b>	Islamic Financial Services Board
<b><u>IMA</u></b>	Internal Models Approach
<b><u>IMM</u></b>	Internal Modeling Method
<b><u>IR</u></b>	Interest Rate
<b><u>LGD</u></b>	Loss Given Default
<b><u>LIBOR</u></b>	London Inter Bank Offered Rate

<b><u>OBIEE</u></b>	Oracle Business Intelligence Enterprise Edition
<b><u>OFSAA</u></b>	Oracle Financial Services Analytical Application
<b><u>OFSAAI</u></b>	Oracle Financial Services Analytical Application Infrastructure
<b><u>OTC</u></b>	Over the Counter
<b><u>Non Securitization Exposure</u></b>	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.
<b><u>PD</u></b>	Probability of Default
<b><u>RBA</u></b>	Ratings Based Approach
<b><u>RBI</u></b>	Reserve Bank of India
<b><u>RDBMS</u></b>	Relational Database Management System
<b><u>Regulatory Reporting</u></b>	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.
<b><u>RRE</u></b>	Residential Real Estate
<b><u>RWA</u></b>	Risk Weighted Assets
<b><u>SCD</u></b>	Slowly Changing Dimension
<b><u>SFA</u></b>	Supervisory Formula Approach
<b><u>SFT</u></b>	Securities Financing Transactions
<b><u>SRWA</u></b>	Simple Risk Weight Approach
<b><u>TXN</u></b>	Transaction
<b><u>SLR</u></b>	Statutory Liquidity Ratio
<b><u>Stress Testing</u></b>	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
<b><u>T2T</u></b>	Table to Table
<b><u>VaR</u></b>	Value at Risk

