Oracle Financial Services Balance Sheet Planning

System Administrator User Guide

Release 8.1.2.0.0

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Financial Services

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OFS Balance Sheet Planning System Administrator User Guide

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Document Control

Version Number	Revision Date	Change Log
1.0	Dec-2020	Created the User Guide for OFS Balance Sheet Planning (OFS BSP) application Release 8.1.2.0.0.

Table of Contents

1 Preface

This section provides information about the Oracle Financial Services Balance Sheet Planning Application Pack's (OFS BSP Pack) System Administrator User Guide.

Topics:

1.1 Audience

Oracle Financial Services Balance Sheet Planning Application Pack's (OFS BSP Pack) Planning Administrator and Planning Analyst User Guide describes all the features and functions of BSP's Planning user interfaces and primarily is intended for the use of Planning Administrators and Planning Users.

1.2 Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For more information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

1.3 Related Information Sources

This section identifies additional documents related to the OFS BSP Application Pack. You can access the below documents online from the Oracle Help Center (OHC) Documentation Library for OFS BSP Application Pack Release 8.1.0.0.0:

- OFS Balance Sheet Planning Release Notes, Release 8.1.2.0.0
- OFS Balance Sheet Planning Application Pack Installation and Configuration Guide, Release 8.1.2.0.0
- OFS Balance Sheet Planning-Planning Administrator and Planning Analyst User Guide, Release 8.1.2.0.0
- OFS Balance Sheet Planning Analytics User Guide Release 8.1.2.0.0
- OFS Balance Sheet Planning Cloning Reference Guide Release 8.1.x
- OFS Balance Sheet Planning Security Guide Release 8.1.x

1.4 Additional Documents to Read

Oracle Financial Services Balance Sheet Planning Application is built on the Oracle Financial Services Advanced Analytical Applications Infrastructure (OFS AAI). See the following OFS AAI documents as no separate documents are required at the pack or application level for Oracle Financial Services Balance Sheet Planning Application Pack:

- OFS Analytical Applications Infrastructure (OFS AAAI) Application Pack Installation and Configuration Guide Release 8.1.2.0.0
- OFS Analytical Applications Infrastructure Administration Guide Release 8.1.x
- OFS Analytical Applications Infrastructure Cloning Reference Guide Release 8.1.x
- OFS Analytical Applications Infrastructure Security Guide Release 8.1.x
- OFS Analytical Applications Infrastructure User Guide Release 8.1.2.0.0

You can access the common document from the OHC Documentation Library:

- OFS Analytical Applications 8.1.2.0.0 Technology Matrix
- OFS Data Model Utilities Guide
- OFS Cash Flow Engine Reference Guide

1.5 Conventions

The following text conventions are used in this document:

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

1.6 Abbreviations

The following table lists the abbreviations used in this document:

Abbreviation	Meaning
AIX	Advanced Interactive eXecutive
BDP	Big Data Processing

Abbreviation	Meaning
DBA	Database Administrator
DDL	Data Definition Language
DEFQ	Data Entry Forms and Queries
DML	Data Manipulation Language
EAR	Enterprise Archive
EJB	Enterprise JavaBean
EPBCS	Enterprise Planning and Budegeting Cloud Service
ERM	Enterprise Resource Management
FTP	File Transfer Protocol
HDFS	Hadoop Distributed File System
HTTPS	Hypertext Transfer Protocol Secure
J2C	J2EE Connector
J2EE	Java 2 Enterprise Edition
JCE	Java Cryptography Extension
JDBC	Java Database Connectivity
JDK	Java Development Kit
JNDI	Java Naming and Directory Interface
JRE	Java Runtime Environment
JVM	Java Virtual Machine
LDAP	Lightweight Directory Access Protoco
LHS	Left Hand Side
MFA	Multi-Factor Authentication
MOS	My Oracle Support
OFSAA	Oracle Financial Services Analytical Applications
OFSAAI	Oracle Financial Services Analytical Application Infrastructure
OFSAAAI	Oracle Financial Services Advanced Analytical Applications Infrastructure Application Pack
OHC	Oracle Help Center
OLAP	On-Line Analytical Processing
OLH	Oracle Loader for Hadoop
ORAAH	Oracle R Advanced Analytics for Hadoop
OS	Operating System
RAM	Random Access Memory
RDBMS	Relational Database Management System

Abbreviation	Meaning
RHEL	Red Hat Enterprise Linux
SFTP	Secure File Transfer Protocol
SID	System Identifier
SSL	Secure Sockets Layer
TNS	Transparent Network Substrate
URL	Uniform Resource Locator
VM	Virtual Machine
WAR	Web Archive
XML	Extensible Markup Language

1.7 What is New in this Release?

The following new features are introduced as part of this release:

1. **Node Level Assumptions**: Node Level Assumptions enables Forecast Balance Assumptions to inherit/override based on the sequence in the planning phase of BSP. This new UI will facilitate users to establish Planning Points that are combinations of Product, Org, and Currency in which the Product Member can be defined as either node or a leaf. Product Node-Level Planning is the purpose of the UI, but it will allow specifying Leaf Values of Product as well as Node-Level Values.
2. **BSP BI Reports**: BSP BI Reports is aimed to replace BSP In-app Java reports with BI Data Visualization capability. The existing 5 Reporting categories is migrated with Out of Box which was prevailing in the earlier version, in addition the new BSP BI Reports provides Hierarchy Level Reporting (that is Legal Entity, Planning Center & Product level) which will facilitate results to roll up at the Node Level for DV Reports which can be accessed across all groups).

   For more information, see OFS Balance Sheet Planning Analytics User Guide Release 8.1.2.0.0.
3. **Non-Maturity Products Modeling**: Helps to create a model that can calculate Core/Volatile Balance for Non-Maturity Products portfolio; based on Historical End of Period Balances available from these products. You can define Non-Maturity Behavior Patterns based on model outputs like how much is core, how long core will be available based on the Decay Rate Profile generated by the model. These in-built PYTHON Models can help you manage, funds available from Non-Maturity Products more precisely to enhance your profitability.

   For more information, see the Non-Maturity Products Data Creation Process and Non-Maturity Products Model Analysis chapters.
4. **Enhanced Cash Flow Edits**: A redesigned Cash Flow Edits is available to check the quality of input data and cleanse it. In addition to a fresh User Interface, rules have been categorized into multiple groups/sub-groups. Users can select one or more groups/sub-group to execute on the selected date. A fresh installation of BSP 8.1.2.0.0 will have only the new Cash Flow Edits.

   For more information, see Cash Flow Edits chapter.

2 Introduction to Balance Sheet Planning

Oracle Financial Services Balance Sheet Planning is designed to help financial services institutions budget for a full balance sheet and the associated net interest margin. Banks have a number of very unique needs when looking ahead. They must be sensitive to economic conditions, and create plans that not only forecast future performance, but also the forward risks they are assuming. Most importantly, they require tools that accurately forecast net interest margin. By accurately modeling the detailed and complex events on a bank's balance sheet, for both the current book of business and forecasted new volumes, Oracle Financial Services Balance Sheet Planning enables the delivery of accurate margin forecasts and comprehensive, meaningful budgets.

This module provides an introduction to Oracle Balance Sheet Planning and discusses its place in the Oracle Financial Services Analytical (OFSAA) group of applications.

Topics:

2.1 Roles in Balance Sheet Planning

OFS Balance Sheet Planning functionality is divided into three distinct roles:

- System Administrator
- Planning Administrator
- Planning User
- Auditor

This User Guide is intended primarily for BSP System Administrators. See the OFS Balance Sheet Planning User Guide for details on the Planning Administrator and Planning User roles. For information on granting roles to OFSAA users, see the OFSAA Instructure User Guide.

Four user types operate the Balance Sheet Planning Application as follows:

Table 1: User Roles in Balance Sheet Planning

Role	Description	Responsibilities
System Administrator	BSP System Administrators are super-users who have access to 100% of BSP's functionality	• Loading, cleansing, and reconciling all business fact data • Maintenance of metadata (dimensions, attributes, hierarchies, and so on) • Building and maintaining all Cash Flow Modelling assumptions including Interest Rate Forecasts • Processing and validating current position forecasts ▪ Once validated, BSP Planning Administrators import current position forecasts to load or "initialize" each new Forecast Set ▪ Once a Forecast Set has been loaded with an initial current position forecast, Planning Users can begin forecasting new business and processing their forecasts • As super-users, System Administrators also have access to all of the functionality provided within BSP's forecasting users interfaces The BSP System Administrator also: • May share some of these responsibilities with other administrators who are responsible for other business areas/disciplines • Can also fill the role of Planning Administrator Exports finished balance sheet and net interest margin forecasts to external planning systems
Planning Administrator	Planning Administrators are responsible for overseeing the planning process	• Defining and maintaining Planning Center User Maps that control Planning User access to Forecast Sets • Administering Forecast Sets through their lifecycle • Oversight of the Planning Process • Planning Administrators have unconstrained access to every Forecast Set but are not involved in the maintenance of any Cash Flow modeling assumptions.
Planning User	Planning Users are granted access to the planning functionality documented in the BSP Planning Administrator and Planning Analyst User Guide	Within their assigned Planning Centers, their role includes: • Forecasting new Business Volumes and pricing margins • Processing new Business Forecasts • Analyzing and approving the results
Auditor	The auditor has Read-Only access for review purposes	

2.2 Oracle Balance Sheet Planning and Other Oracle Financial Services Applications

Oracle Financial Services Balance Sheet Planning (BSP) operates on top of a common infrastructure layer: Oracle Financial Services Analytical Applications Infrastructure (OFSAAI). OFSAA Applications form a comprehensive decision support solution that significantly enhances Enterprise Risk and Performance Management Functions across a Financial Institution.

2.3 Oracle Balance Sheet Planning Key Benefits

The key benefits of OFS BSP are given as follows:

2.3.1 Centralized Administration of Cash Flow Modelling Assumptions

System Administrators build and maintain Cash Flow Modelling assumptions including:

- All Rate Management Functions
- Interest Rate Curves and Historical Rates
- Currencies and Historical Currency Exchange Rates
- Rate Forecasts
- All Modelling Assumptions including
- Product Characteristics
- Behavior Patterns, Payment Patterns, and Repricing Patterns
- Prepayment Rules and Prepayment Models
- Transfer Pricing Rules
- Transfer Pricing Adjustment Rules

2.3.2 Rigorous Calculations

Oracle BSP is designed to operate on transaction-level data using Oracle's highly accessible and flexible financial services Data Model. Each account, as well as all forecasted new-business activity, is modeled independently on a Daily Cash Flow basis.

2.3.3 Decentralized Collection and Processing of Balance Sheet and Margin Forecasts

- Collect and process forecasts across large numbers of distributed Planning Centers.
- Planning Administrators build and maintain maps that assign planning users to Planning Centers.
- Planning Administrators assign a Planning Center - User Map to each Forecast Set to Control Access.
- These Planning Center - User Maps support one-to-one assignments or many-to-many assignments
- You can have as many maps as you need, but the same Planning Center - User Map can be used for multiple Forecast Sets.
- As super-planning users, Planning Administrators can all Forecast Sets without constraint.

2.3.4 Defined Workflows for Each Planning User

A “Planning Point” represents a distinct Product/Org/Currency combination found on your balance sheet.

On logging into the system and after selecting a Forecast Set to work with, BSP utilizes Planning Center <- -> User Maps to present each Planning User with a set of Planning Points that he/she is responsible for forecasting.

Each Planning Point features a clear Yes or No status regarding the following key indicators:

- Are historical actuals available for the Planning Point?
- Does current position forecast data exist for the Planning Point?
- Is there a new business forecast for the Planning Point?
- Has the new business forecast been processed through the Cash Flow Engine?
- Have the forecast results for the Planning Point been reviewed/approved?

Planning Users forecast new business volumes and margins for each Planning Point, process their forecasts, and review their results.

2.3.5 Distinct Forecast Sets

A Forecast Set constitutes a discrete set of planning data. Examples might include the 2022 Budget, 18-Month Rolling Forecast as of October 2021, and so on.

- Each Forecast Set represents a specific Scenario and Version of Forecast Data for a specified Starting Date and a specified duration.
- You can have as many Forecast Sets as you need.
- Only BSP System Administrators and BSP Planning Administrators can define and manage Forecast Sets.

BSP allows you to work simultaneously with multiple Forecast Sets. Two different Forecast Sets could be for the same period where one is for a Forecast Scenario and the other is for the Budget Scenario. Each of these Forecast Sets might also have multiple versions. You may also have forecast sets for different periods (example, one for October, one for November, and one for December).

Every Forecast Set having the same starting date will share the same underlying detailed instrument data and will share the same current position forecast results, but each Forecast Set stores its own forecasts of new business volumes and spreads as well as its own results for the new business forecasts.

2.3.6 Rolling Forecast Sets

Forecast Sets can reference other Forecast Sets. For example, when you are working on "Version 2" of a Forecast Set, the Administrator can configure the user interfaces to allow users to work on Version 2 while also giving them side-by-side views of data found in a previous Forecast Set (e.g., Version 1).

The same idea applies across time. For example, if you are working on a Forecast Set called "18 Month Rolling Forecast as of Jun 2022", that Forecast Set could display results from a previous Forecast Set (example, "18 Month Rolling Forecast as of May 2022".

2.3.7 Option to retain Planning Preferences from a previous Forecast Set

When building a new Forecast Set, BSP provides several options for recovering Forecast Data from previous Forecast Sets. One option is to retain the Forecast Balance Methods and/or Forecast Pricing Methods from a previous Forecast Set. Another option is to also retain the Forecast Balance drivers and/or Forecast Pricing drivers (that is, the actual forecast data) from a previous Forecast Set. The usefulness of this functionality is clear in the simple example of building a new version of a working set (e.g., Version 2 vs. Version 1), but it is particularly useful over time. Any new Forecast Set can be almost 100% ready for total-bank processing as soon as it is "initialized" if it can reference and re-use data from a previous Forecast Set.

2.3.8 Forecast Set Lifecycle

Administrators manage the lifecycle of each Forecast Set from Defined to Deleted.

- Defined
  - Forecast Set is defined in outline
- Initialized
  - Forecast Set has been loaded with a current position runoff forecast provided by the System Administrator
  - Administrators can access all planning functions on Initialized Forecast Sets
  - Planning Users have no access to Initialized Forecast Sets
- Published
  - Planning User can access all Planning Functions on Published Forecast Sets
  - Administrators can revoke access by re-setting a Forecast Set's status to Initialized
- Locked
  - Locked Forecast Sets may not be updated but can be retained as required
  - Locked Forecast Sets can continue to serve as "Prior Forecast Set" or as "Initialization Forecast Set" for other Forecast Sets
- Deleted
  - The Forecast Set definition has been deleted
  - The Forecast Set's projected new business volumes and margins have been deleted
  - All of the Forecast Set's result data have been deleted (both current book and new business results)
  - All of the logging data from OFSAA Batch jobs associated with the Forecast Set have been deleted

2.4 Oracle Financial Services Enterprise Performance Management

Financial Institutions, their regulators as well as their shareholders are focused on the need to measure and meet risk-adjusted performance objectives, price products to reflect their true risk, and better understand how their institution is impacted by threats to liquidity, capital adequacy, and exposure to market rate volatility.

2.4.1 OFSAA Data Model

OFSAA Data Model (OFSAADM) is shipped with optimized Data Structures and pre-packaged Data Elements developed specifically for the Financial Services Industry. OFSAADM is the foundation for the OFS Applications. It provides the database structures necessary to support the Individual Business Applications.

2.4.2 OFSAA Infrastructure

OFSAA Infrastructure is the foundation for OFSAA. It provides support for User Administration, Metadata Management, a Processing Framework, Forms Framework, and additional capabilities necessary to support the Individual Business Applications.

2.4.3 OFSAA Funds Transfer Pricing

Oracle Financial Services Funds Transfer Pricing is the industry's first and leading matched maturity funds transfer pricing application, enabling financial institutions to determine the spread earned on assets, from funding sources, and the spread earned as a result of interest rate exposure for each customer relationship. This enables accurate assessment of profitability along product, channel, and business lines, as well as the centralization of interest rate risk so it can be effectively managed. Oracle Financial Services Funds Transfer Pricing is fully integrated with Oracle's Financial Services Analytical Applications and shares a common customer account-level data model.

The transfer pricing process isolates the four major sources of a bank's margin:

- The spread earned on assets
- The spread earned on liabilities
- The spread earned or lost as a result of Interest Rate exposure
- The spread earned or lost as a result of Embedded Options such as prepayments

Measuring and managing interest margin offers tremendous profit opportunities. By separating the components of net interest income, Oracle Funds Transfer Pricing isolates rate risk into your funding center where it can be centrally managed. In turn, business units are held accountable for what they can control: pricing and profitability. Armed with this highly accurate information, companies make solid, supportable decisions that lead to increased success in the marketplace.

2.4.4 OFSAA Profitability Management

Oracle Financial Services Profitability Management enables financial services institutions to calculate profitability by-products, channels, segments, and even individual customers. These profitability

calculations are adjusted for risk, and they drive Risk-Adjusted Performance Management (RAPM), an imperative for financial services institutions operating in this rapidly evolving and complex industry.

Isolating and analyzing business unit profitability is only the first step in building effective profitability management. To hold operational managers truly accountable for profitability, senior management must give them the power to identify the products that are profitable in each market segment, for each customer.

Together with OFSAA Transfer Pricing, OFSAA Profitability Management is the tool that delivers this power. Profitability Management links general ledger, account-level, and statistical data together to produce detailed financial statements for individual business units, products, and customers. Combining powerful modeling and disciplined accounting, OFSAA Profitability Management delivers complete, accurate, and inclusive profiles of profitability.

2.4.5 OFSAA Price Creation and Discovery

Oracle Financial Services Price Creation and Discovery is an interactive application that provides real-time transfer rates to support pricing loan transactions that reflect immediate market conditions. Risk-based pricing queries are directly integrated with the Oracle Financial Services Funds Transfer Pricing Solution and leverage the same business rule logic. Query results incorporate all details of the underlying transfer price and include all elements of a product's profit and loss, including the allocated expense, expected loss, and capital charge.

2.4.6 OFSAA Asset Liability Management

Volatile market conditions and increasing regulatory pressures are placing greater demands on the risk management function. These stresses are driving financial institutions to review their current Risk Modeling and Measurement capabilities. Yet, these circumstances also provide institutions with the opportunity to update technology solutions to systems fully integrated across the risk and performance spectrum. Departmental, one-off solutions are no longer viable alternatives in an environment where all systems need to work together.

Oracle Financial Services Asset Liability Management (ALM) helps Financial Services Institutions measure and manage Interest Rate Risk and Liquidity Risk, perform balance sheet valuations, and forecast both Net Interest Income and Net Income. The Oracle Financial Services ALM Solution can measure and model every loan, deposit, investment, and off-balance sheet instrument individually, using both deterministic and Stochastic Methods. This helps institutions gain a better understanding of the risks they have assumed and their sensitivity to changes in economic conditions.

2.4.7 OFSAA Balance Sheet Planning

Oracle Financial Services Balance Sheet Planning is designed to help Financial Services Institutions budget for a full balance sheet and the associated profit and loss statement. Banks have a number of very unique needs when looking ahead. They must be sensitive to economic conditions, and create plans that not only forecast future performance, but also the forward risks they are assuming. Most importantly, they require tools that accurately forecast net interest margin. By accurately modeling the detailed and complex events on a bank's balance sheet, for both the current book of business and forecasted new volumes, Oracle Financial Services Balance Sheet Planning enables the delivery of accurate margin forecasts and comprehensive, meaningful budgets.

2.4.8 OFSAA Business Intelligence Applications

OFSAA Business Intelligence (BI) Applications are complete, prebuilt BI solutions that deliver intuitive, role-based intelligence for everyone in an organization—from front-line employees to senior management—that enable better decisions, actions, and business processes.

2.4.9 Oracle Financial Services Analytical Overview

For over 15 years, Oracle has set the standard for Analytical Applications in financial services. With our applications financial services organizations can achieve management excellence with a lower total cost of ownership, due to our integrated architecture, combining performance and risk applications into a single, seamlessly integrated framework.

In today's turbulent markets, financial institutions require a better understanding of the relationship between risk and return, while strengthening competitive advantage and enhancing long-term customer value. Oracle Financial Services Analytical Applications enable Financial Institutions to measure profitability 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.

3 OFSAAI - An Overview

Oracle Financial Services Analytical Applications Infrastructure (OFSAAI) is a general-purpose Analytics Applications infrastructure that provides the tooling platform necessary to rapidly configure and develop Analytic Applications for the financial services domain. It is built with Open-Systems Compliant architecture providing interfaces to support business definitions at various levels of granularity.

Applications are built using OFSAAI by assembling Business Definitions or Business Metadata starting from Data Model to lower grain objects like Dimensions, Metrics, Security Maps, and User Profile to higher-order objects like Rules, Models, and Analytic Query Templates which are assembled using the lower grain ones. In addition to application definition tools, it provides the entire gamut of services required for Application Management including Security Service, Workflow Service, Metadata Management, Operations, Life-cycle Management, Public API's and Web Services that are exposed to extend and enrich the tooling capabilities within the applications.

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

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

- Track enterprise performance across Information Data Store.
- Use one interface to access all Enterprise Databases.
- Create consistent business dimensions and measures across Business Applications.
- Automate the creation of coordinated Data Marts.
- Use your own business language to get fast and accurate answers from all your Databases.
- Deploy an open XML and Web-based Solution against all major relational or Multi-dimensional Databases on Microsoft Windows and UNIX Servers.

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

3.1 Components of OFSAAI

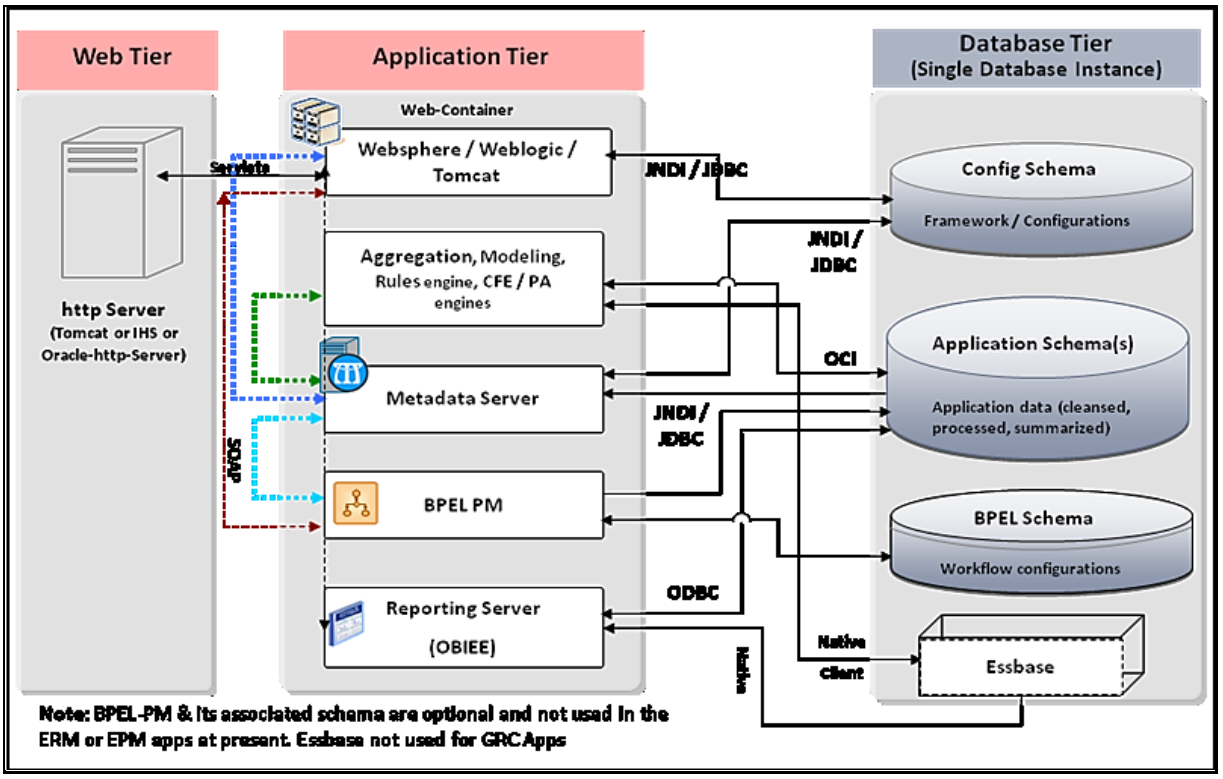
The OFSAA Infrastructure consists of the following components/modules that are used to deploy an Analytical Solution.

- Data Model Management
- Data Management Tools
- Unified Analytical Metadata
- Data Entries Forms and Queries
- Rules Run Framework

- Infrastructure Modules Operations
- Questionnaire
- Infrastructure Modules System Configuration and Identity Management
- Object Administration

All components are encapsulated within a common Security and Operational Framework as shown in the following figure.

Figure 1: Security and Operational Framework



Infrastructure also supports many business analytical solution(s) like Operational Risk, PFT, and Basel, which are licensed separately to the organization. This manual provides an overview of only the technological components.

For a detailed overview of OFSAAI Modules, see Modules in OFSAAI section.

3.2 Accessing OFSAA Applications

OFSAA can be accessed through your Web Browser as soon as the System Administrator (SA) installs and configures Oracle Financial Services Analytical Applications.

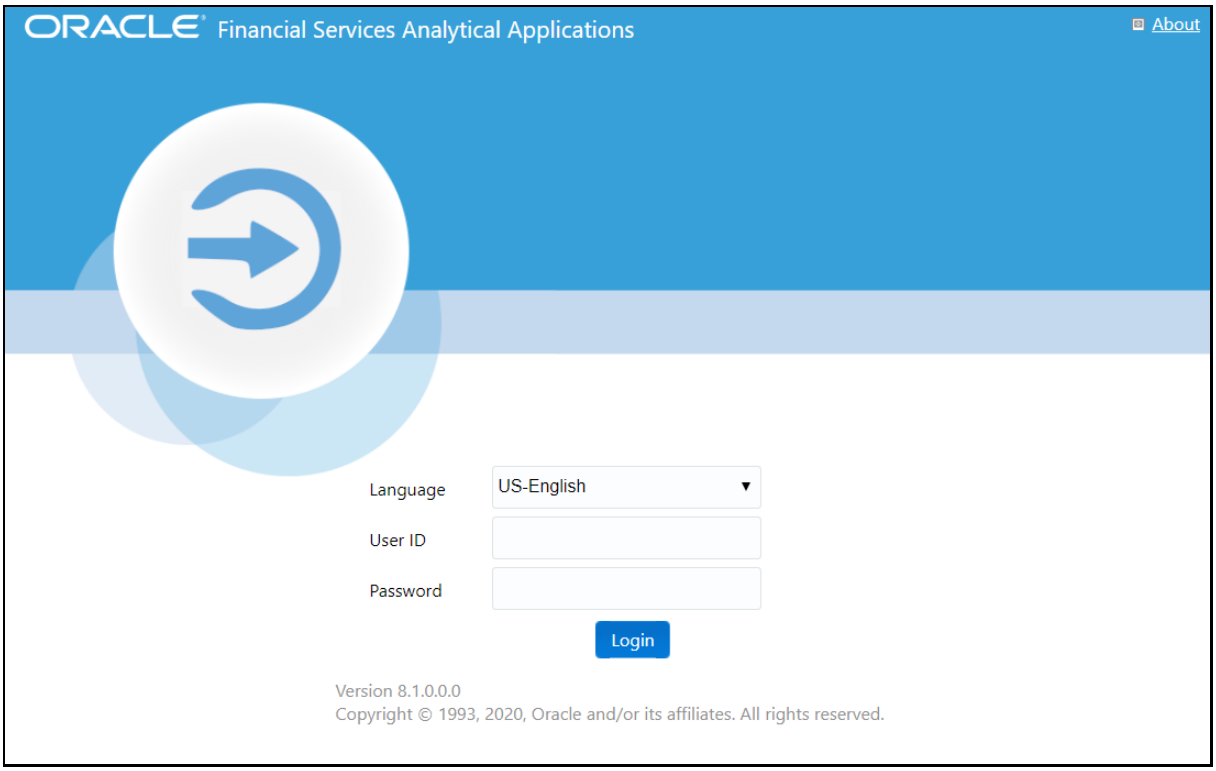
The SA will provide you with a link through which you can access Oracle Financial Services Analytical Applications. You can access the login window through your Web Browser using the URL `http(s):<IP Address of the Web Server >:<servlet port>/<context name>/login.jsp`.

You can also log in to the application with the hostname instead of the IP Address.

3.3 OFSAA Login Page

On entering the URL (`<IP Address/hostname of the Web Server>:<servlet port>/<context name>/login.jsp`) in your browser window, the *OFSAA Login Page* is displayed:

Figure 2: OFSSA login Page



You can select the required language from the **Language** drop-down list. The language options displayed in the drop-down list are based on the language packs installed for the OFSAA infrastructure. Based on the selected language, the appropriate Language Login Window is displayed.

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. For details on how to change a password, see the Changing Password Section.

In case the OFSAA Setup has been configured for OFSAA native Security Management System (SMS) Authentication, the password to be entered will be as per the password restrictions set in the OFSAA SMS repository.

3.3.1 Log in as System Administrator

Post-installation, the first login into Infrastructure is possible only for a System Administrator through User-ID “sysadmn”. This ID is created at the time of installation with the default password as “password0”.

Enter User ID as “sysadmn” and password as “password0”. Click **Login**.

3.3.2 Log in as System Authorizer

System Authorizer ID is also created at the time of installation with the default password “password0”. This ID is required to authorize the users created by the system administrator.

Enter login id as “**sysauth**” and password as “password0”. Click **Login**.

3.3.3 Log in as Business User

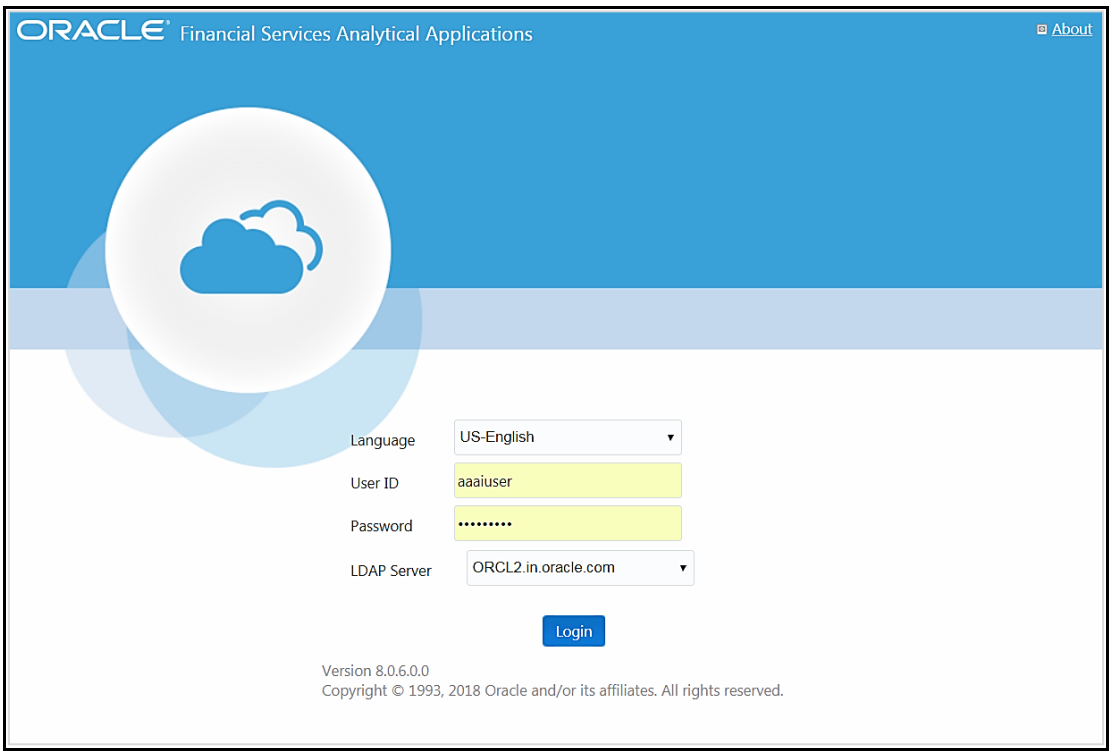
The Business Users will be created by System Administrator and will be authorized by the System Authorizer.

Enter User ID and Password provided by the System Administrator and click **Login**.

3.3.3.1.1 OFSAA Login if LDAP Servers are configured

If the OFSAA setup has been configured for LDAP Authentication, the Login Page is displayed as shown:

Figure 3: OFSSA Login Page



5. Enter your **User ID** and **Password (as in LDAP store)** in the respective fields.
6. Select the appropriate **LDAP Server** from the drop-down list, against which you want to get authenticated. This is optional. If you do not select any server, you will be authenticated against the appropriate LDAP Server.

> **NOTE** For SYSADMN/ SYSAUTH/ GUEST Users, no need to select any LDAP Server as they are always authenticated against the SMS store. Additionally, in case a specific user has been marked as "SMS Auth Only" in the *User Maintenance* window even though the OFSAA instance is configured for LDAP authentication, then that user will also be authenticated against the SMS store instead of LDAP store. The user has to enter the password as per the SMS store.

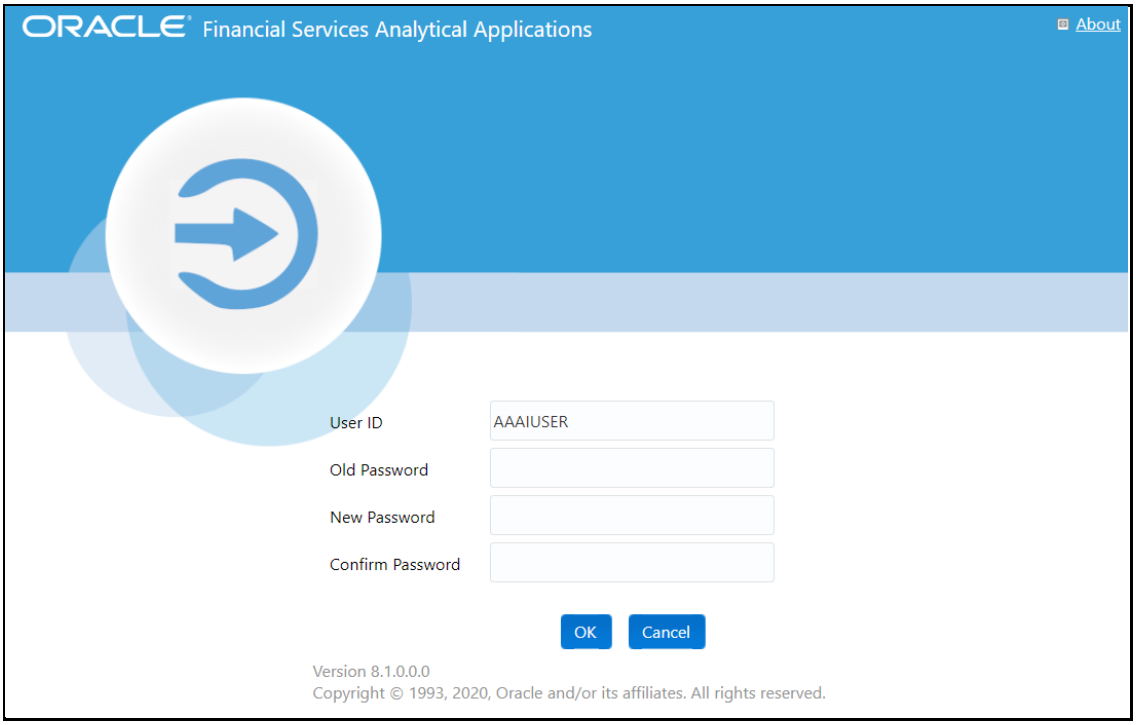
3.4 Changing Password

You can choose to change your password any time by clicking your username appearing on the right top corner and selecting **Change Password**.

Note that this option is available:

- If **SMS Authentication and Authorization is configured as Authentication Type** from the *Configuration* Window**.**
- If **LDAP Authentication and SMS Authorization** is **configured as Authentication Type** from the Configuration Window and the **SMS Auth Only** check box is selected for the user in the *User Maintenance* Window**.**
- If **SSO Authentication and SMS Authorization** is **configured as Authentication Type** from the *Configuration* Window and the **SMS Auth Only** check box is selected for the user in the *User Maintenance* Window**.**

Figure 4: OFSSA Change Password window



In the *Change Password* Window, enter a new password, confirm it, and click **OK** to view the *OFSAA Login* Window. See 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.
- The new password should be different from previously used passwords based on the password history, which can be configured. For more information, see the Configuration section in the System Configuration Chapter.

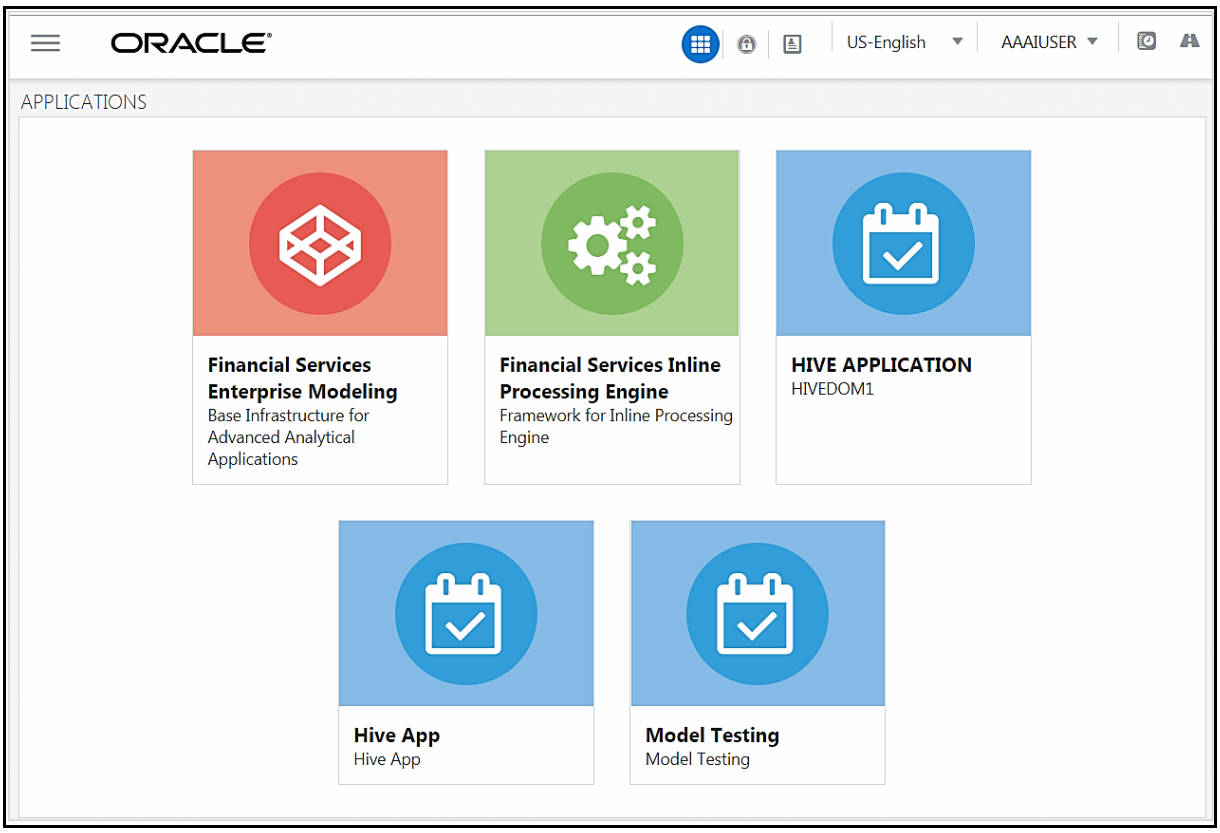
If you encounter any of the following problems, contact the System Administrator:

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

3.5 OFSAA Landing Page

On successful login, the *OFSAA Landing* Page is displayed.

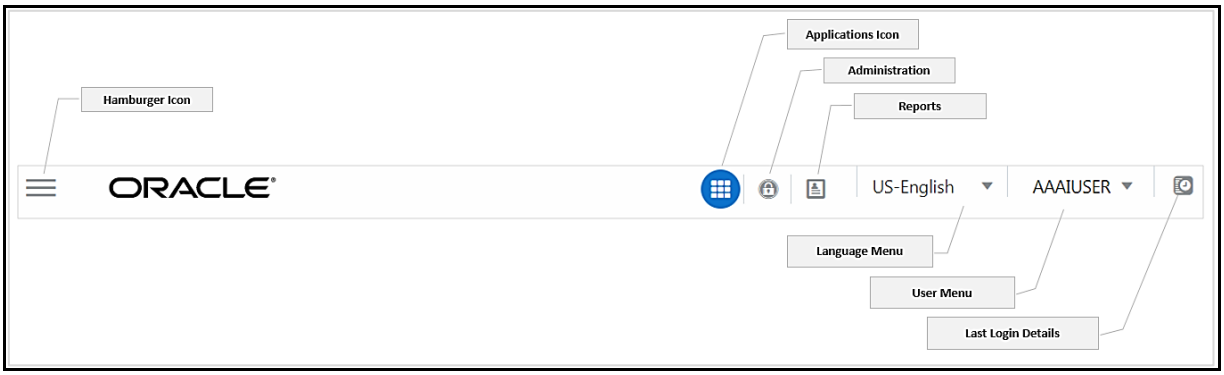
Figure 5: *OFSAA Landing Page*



OFSAA Landing Screen shows the available Applications as tiles, for which a user has access. Clicking the respective Application tile launches that particular Application. You can change the Landing Page based on your preference. For more information, see the Preferences Section.

3.5.1 Header

Figure 6: OFSSA Header



Hamburger/Navigation Menu Icon- This icon is used to trigger the Application Navigation Drawer.

Application Icon- This icon is used to show the available Applications installed in your environment at any time.

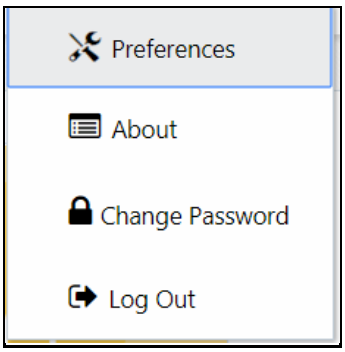
Administration Icon- This icon is used to go to the *Administration* Window. The *Administration* Window displays modules like System Configuration, Identity Management, Database Details, manage OFSAA Product Licenses, Create New Application, Information Domain, Translation Tools, and process Modelling Framework as Tiles.

Reports Icon- This icon is used to launch various User Reports such as user Status Report, User Attribute Report, User Admin Activity Report, User Access Report, and Audit Trial Report.

Language Menu- It displays the language you selected in the OFSAA Login Screen. The language options displayed in the Language Menu are based on the language packs installed in your OFSAA instance. Using this menu, you can change the language at any point of time.

User Menu- Clicking this icon displays the following menu:

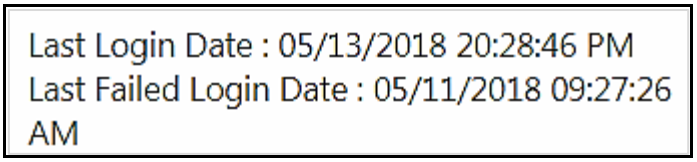
Figure 7: User Menu



- **Preferences**- To set the OFSAA Landing Page.
- **Change Password**- To change your password. For more information, see the Change Password section. This option is available only if SMS Authorization is configured.
- **Log Out**- To log out from OFSAA Applications.

Last Login Details - This displays the last login details as shown:

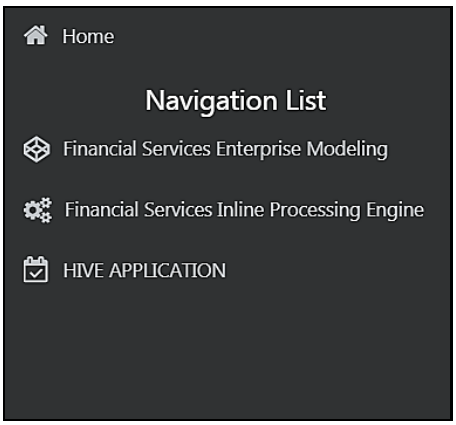
Figure 8: Last Login Details



3.5.2 Navigation Drawer

Click **Hamburger Icon** to launch the Navigation Drawer as shown:

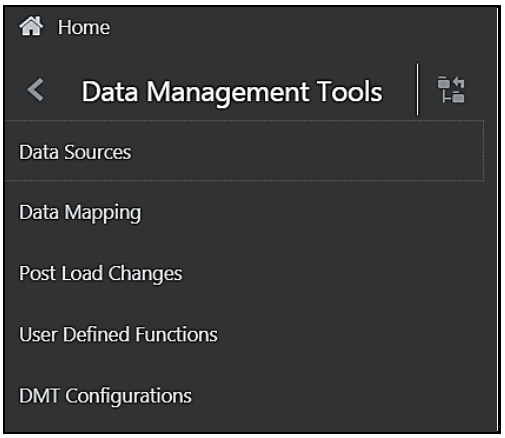
Figure 9: Navigation List drawer



Here the navigation items appear as a list. The First Level menu shows the installed applications. Clicking an application displays the second-level menu with the application name and Common tasks menu. The arrangement of the menu depends on your installed application.

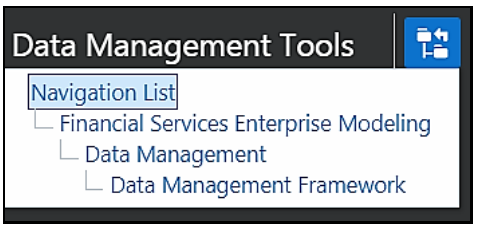
Clicking an item in the menu displays the next level sub-menu and so on. For example, to display Data Sources, click Financial Services Enterprise Modeling>Data Management>Data Management Framework>Data Management Tools>Data Sources.

Figure 10: Data Management Tools Menu



Click  **Hierarchical Menu** to display the navigation path of the current sub-menu as shown:

Figure 11: Data Management Tools Hierarchical Menu



The RHS Content Area shows the Summary Page of Data Sources. Click anywhere in the Content Area to hide the Navigation Drawer. To launch it back, click the Hamburger Icon.

Click **Home** to display the OFSAA Landing Screen.

3.6 Modules in OFSAAI

- **Data Model Management** is intended for uploading the Warehouse Data from the Operational Systems to Database Schema using ERwin XML file.
- **Data Management Framework** 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. This module is used for managing Data Movement. This includes sub-modules like Data Sources, Data Mapping, Post Load Changes, and Data Quality Framework.
- **Data Entry Forms and Queries** Module facilitates you to design Web-based user-friendly Data Entry Windows with a choice of layouts for easy Data View and Data Manipulation. This module has sub-modules like Forms Designer, Data Entry, and Excel Upload.
- **Data Maintenance Interface** Module helps in the design and creation of forms that are in a user-specified format. Authorized users with the required privileges can use these forms to view and update existing data in the Database.
- **Unified Analytical Metadata** is intended for the Information and Business Analysts who are instrumental in supporting and affecting analytical decisions. This module is used to define and maintain Analytical Metadata Definitions. This module has sub-modules like Alias, Derived Entity, Dataset, Dimension Management, Business Measure, Business Processor, Build Hierarchy, Business Dimension, Essbase Cube, Filters, Expression, Map Maintenance, and Cube Migration.
- **Rule Run Framework** facilitates you to define a set of rules, reporting objects, and processes that are required to transform data in a warehouse. This module has sub-modules like Rule, Process, Run, and Manage Run Execution.
- **Metadata Browser** module provides extensive browsing capabilities of metadata, helps in tracking the impact of changes to metadata, and traces through to the source of originating data. The metadata in the *Metadata Browser* Window is organized into different categories like Data Foundation Metadata, Business Metadata, and Process Metadata.
- **Operations** Module facilitates you in the administration and processing of business data to create the highest level of efficiency within the system and to derive results based on a specified rule. It includes sections like Batch Maintenance, Batch Execution, Batch Scheduler, Batch Monitor, Batch Processing Report, Batch Cancellation, and View Log.
- **Questionnaire** Module is an assessment tool, which presents a set of questions to users, and collects the answers for analysis and conclusion. It can be interfaced or plugged into OFSAA Application Packs.
- **System Configuration & Identity Management** Module facilitates System Administrators to provide Security and Operational Framework required for Infrastructure. The *Administration* Window has a Tiles menu with Tiles like System Configuration, Identity Management, Database Details, Manage OFSAA Product Licenses, Create New Application, Information Domain, Translation Tools, and Process Modelling Framework.
- **Object 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. These activities are mainly done at the initial stage and then on a need basis. It includes sections like Object Security, Object Migration, and Utilities

(consisting of Metadata Difference, Metadata Authorization, Save Metadata, Write-Protected Batch, Component Registration, Transfer Document Ownership, and Patch Information).

3.7 Logging in OFSAA

Logging in OFSAA is done using Log4J. The log files are available in the following locations:

- **UI/Web Logs**: `<DEPLOYED LOCATION>/<Context>.ear/<Context>.war/logs`
- **Application Logs**: `$FIC_HOME/logs`
- **Execution Logs**: `/ftpshare/logs/<MISDATE>/<INFODOM>/<COMPONENT NAME>/<LOG FILE NAME>.log`

3.7.1 Purging of Logs

Configure the logger-related attributes in the `RevLog4jConfig.xml` file available in the `$FIC_HOME/conf/` folder. Each log file will have appenders in this file and attributes pertaining to this particular appender can be changed.

The default size of the log files is set to 5000 KB and the number of maximum backup log files retained is set to 5, both of which are configurable. Increasing these parameters to a higher value should depend on the Server Hardware Configurations and may reduce the performance.

To configure the Logs file size, follow these steps:

1. Navigate to `$FIC_HOME/conf` folder or `<DeployedLocation>/<context.war>/<context>/` and locate `RevLog4jConfig.xml` file.
2. Configure the logger-related attributes in the `RevLog4jConfig.xml` file. This file will have Appenders for each log file.

   Sample Appender for UMM log file is shown:

```
<RollingFile name="UMMAPPENDER"
fileName="/scratch/ofsaaweb/weblogic/user_projects/domains/cdb/applicat
ions/cdb.ear/cdb.war/logs/UMMService.log"

filePattern="/scratch/ofsaaweb/weblogic/user_projects/domains/cdb/appli
cations/cdb.ear/cdb.war/logs/UMMService-%i.log" >

<PatternLayout>

  <Pattern> [%d{dd-MM-yy HH:mm:ss,SSS zzz aa}{GMT}] [%-5level] [WEB]
%m%n </Pattern>

  </PatternLayout>

  <Policies>

       <SizeBasedTriggeringPolicy size="5000 KB" />

  </Policies>

   <DefaultRolloverStrategy max="5"> <!-- number of backup files -->

       </DefaultRolloverStrategy>

  </RollingFile>
```

3. To change the log file size, modify the value set for `SizeBasedTriggeringPolicy size`.
4. To change the number of backup files to be retained, modify the value set for `DefaultRolloverStrategy max`.

3.7.2 Log File Format

In OFSAA, the log format is standardized and can be read by any standard log analysis tool. The standard log format is as follows:

```
[GMT TIMESTAMP] [LOGGER LEVEL] [LOGGER LOCATION]  [MODULE/COMPONENT]
[LOGGED IN USER] [JAVA CLASS] <LOG MESSAGE>
```

Sample:

```
[25-04-18 10:08:41,066 GMT AM] [INFO    ] [WEB]  [UMM]  [UMMUSER]
[BUSINESSMETADATA] Inside createImplicitObjectsForAllInfodom

[25-04-18 10:08:41,069 GMT AM] [INFO    ] [WEB]  [UMM]  [UMMUSER]
[BUSINESSMETADATA] Call createImplicitObjectsForMapper for infodom =
TESTCHEF

[25-04-18 10:08:42,142 GMT AM] [DEBUG] [WEB]  [UMM]  [UMMUSER]
[BUSINESSMETADATA] Source created successfully for infodom TESTCHEF

[25-04-18 10:08:42,142 GMT AM] [INFO    ] [WEB]  [UMM]  [UMMUSER]
[BUSINESSMETADATA] Start - code added to create user group hierarchy for
this infodom

[25-04-18 10:08:42,142 GMT AM] [INFO    ] [WEB]  [UMM]  [UMMUSER]
[BUSINESSMETADATA] Inside createUserGroupHierarchyForInfodom
```

4 Data Entries Forms and Queries

Data Entry Forms and Queries (DEFQ) within the Infrastructure system facilitate you to design web-based user-friendly *Data Entry* windows with a choice of layouts for easy data view and data manipulation. An authorized user can enter new data and update the existing data in the shared database. Data entry Forms are primarily focused to create data entry systems that access the Database and load the generated Input Data.

To access Data Entries Forms and Queries:

1. Login to OFSAA.
2. Click  from the header to display the applications in a Tiles Menu.
3. Select the **Financial Services Enterprise Modeling** Application from the Tiles Menu. The Navigation list to the left is displayed.
4. Click **Common Tasks** to expand the list.
5. Click **Data Entries Forms and Queries** to expand the list further. The following links are displayed on the Navigation list:
   a. Excel Upload (Atomic)
   b. Forms Designer
   c. Forms Authorization
   d. Data Entry

4.1 Excel Upload (Atomic)

The *Atomic Schema Upload* Window consists of Excel Utilities such as Excel-Entity Mappings and Excel Upload. The Excel Entity Mappings and Upload utilities have 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 the XLADMIN Function Role can only define mapping and authorize, but cannot upload the file.
- Users with the XLUSER Function can only retrieve Mapping Definition (pre-defined by XLADMIN User) and can upload the file based on the retrieved mapping.

Click on the below links to view the section in detail.

- Excel-Entity Mappings
- Excel Upload

4.1.1 Navigating to Excel Upload (Atomic)

You can access the *Excel Upload* Window by expanding **Data Entries Forms and Queries** from the Navigation Lst to the left and clicking **Excel Upload (Atomic)**.

4.1.2 Excel-Entity Mappings

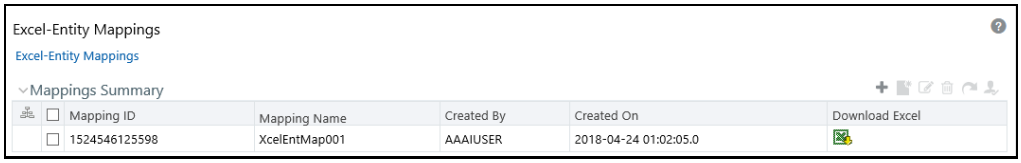
Excel-Entity Mapping helps you to map Excel Data to the destination table in the database. Excel-Entity Mapping supports excel files created in Microsoft 2007 and earlier versions along with the option to map and upload multiple sheets created within a single excel file. You need to have the XLADMIN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

4.1.3 Adding Excel-Entity Mappings

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

1. From the LHS menu of *DEFQ- Excel Upload* Window, click **Excel-Entity Mappings**.
   The *Excel-Entity Mappings* Window is displayed.

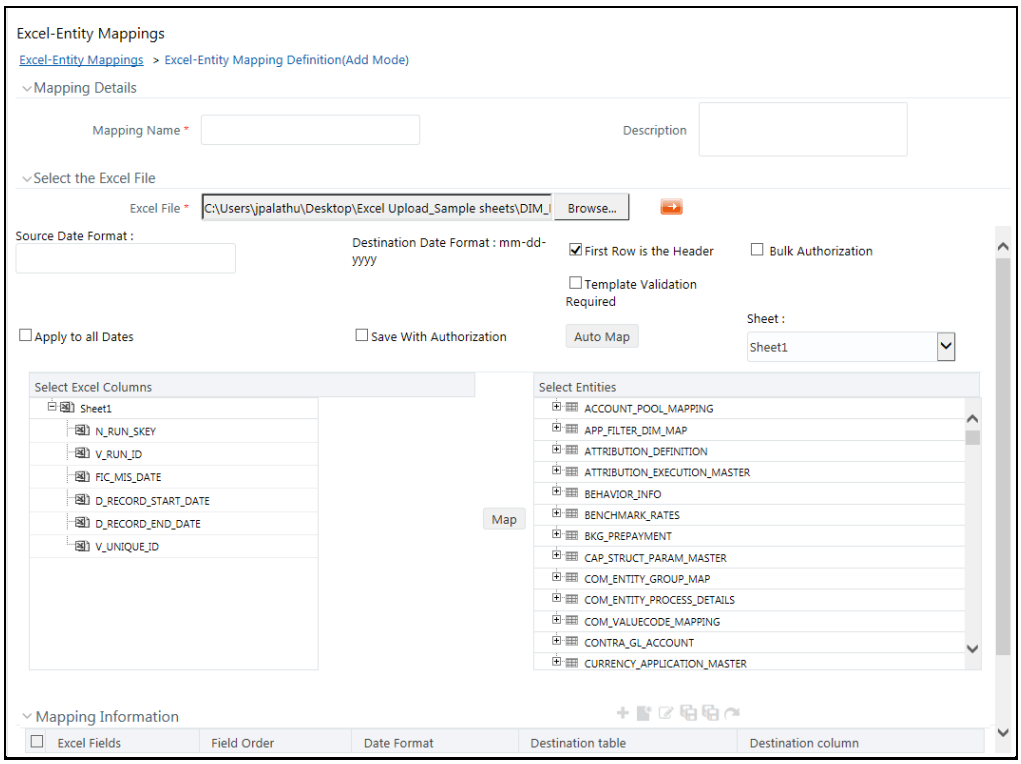
Figure 12: Excel-Entity Mappings Window



2. Click the ➕ button in the Mappings Summary toolbar.
   The *Add Excel-Entity Mappings* Window is displayed.
3. Enter the **Mapping Name** and a brief **Description**.
4. Click **Browse**.
   The Choose File to Upload dialog is displayed.
5. Select the required Excel file to be used as the template and click the › button.

   The columns in the selected Excel template are listed in the Select Excel Columns Grid and the Database Tables are listed in the Select Entities Grid.

Figure 13: Excel-Entity Mappings Window



6. Enter the format in which the dates are stored in the excel sheet in the **Source Date Format** Field.
7. Select the **Apply to all Dates** check box if you want to apply the Source Date format to all date fields in the Excel Sheet.
8. Select the **First Row is the Header** check box if your Excel Template has a header row.
9. Select the **Template Validation Required** check box to validate whether the Excel Template you use is the same as the Excel Sheet you use during the Excel Upload Window. The validation is done when you upload the excel sheet. The error will be displayed if there is any mismatch between the Excel Template you use to map and the actual Excel Sheet you upload.
   This field is displayed only if you have selected the **First Row as the Header** check box.
10. Select the **Bulk Authorization** check box 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. To select Bulk Authorization, you need to have **Save with Authorization** check box selected.

11. Select **Save with Authorization** check box to authorize the data upon successful data load. The three mandatory fields namely Maker ID, System Date, and Authorization Status are displayed in the Select Excel Columns Grid.
    You need to map these fields to the corresponding columns in the Select Entities Grid. The

value for the Maker ID Column is updated with the User ID of the user who is performing the Excel Upload. The value for Maker Date is updated with the current System Date during which the upload is performed and the value for Authorization Status is updated with the flag 'U'. See Save with Authorization to create a Form where the uploaded data can be authorized.

12. Select a column from the Select Excel Columns grid and select an attribute or column from the required table from the Select Entities grid. Click **Map**.
13. Click **Automap**.
    The respective columns with similar names in the Excel sheet and the database are 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.
14. Click **Save Mapping**.
    The *Excel-Entity Mapping* Window displays the Excel-Database Table Mapping details.

    In the *Excel-Entity Mappings* Window, you can also do the following:

    - Click the View button in the Mappings Summary toolbar to **View** the mapping details.
    - Click the Edit button in the Mappings Summary toolbar to **Edit** the mapping details.
    - Click the Delete button in the Mappings Summary toolbar to **Delete** the mapping details.
    - Click the Download Excel button to download the Excel template used in the mapping.

4.1.4 Excel Upload

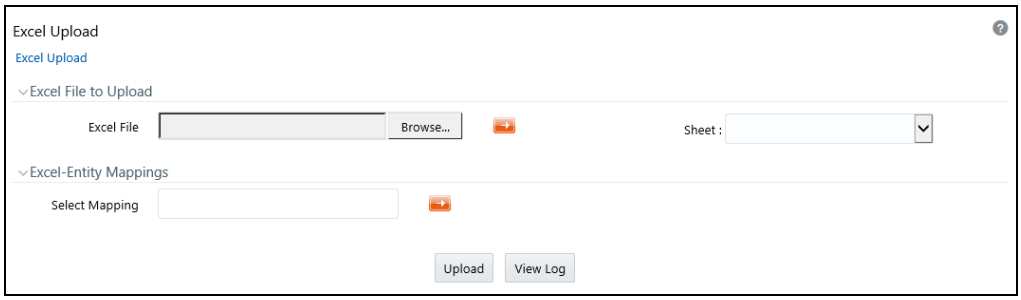
Excel Upload helps you to upload Excel Data to the destination table in the database. You need to have the "XLUSER" function role mapped to access the *Excel Upload* Window and retrieve mapping definition (pre-defined by XLADMIN User) to upload Excel Data. Excel Upload supports Excel files created in 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* Window:

1. Click **Browse** in the Excel File to Upload Grid.
   The Choose File to Upload dialog is displayed.
2. Select the required Excel file and click the Move button.

   Select the required sheet in the Excel file from the **Sheet** drop-down list and the Preview Grid displays the data of the selected sheet of the Excel file.

Figure 14: Excel Upload Window



3. Click the Move button in the Excel-Entity Mappings Grid.
   The Mapping Selector dialog is displayed with the pre-defined mapping details.
4. Select the check box adjacent to the required Mapping Definition and click **OK**.

> **NOTE** You can download the Excel template used in the mapping by clicking the Download Excel Button.

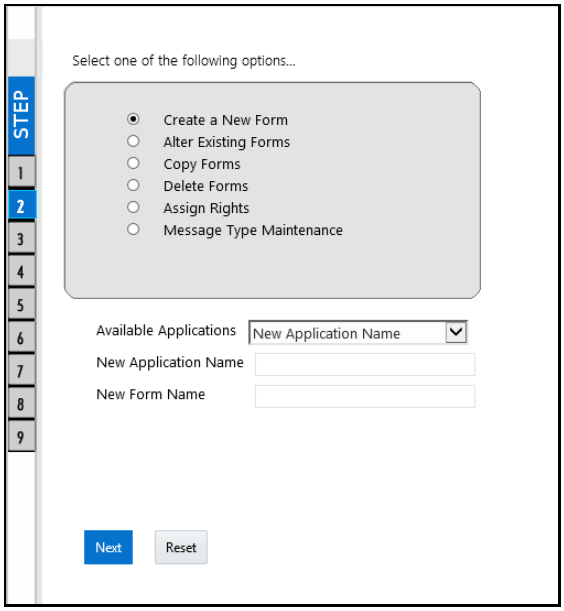
5. Click **Upload**.
   A confirmation dialog is displayed on successful upload and the Excel Data is uploaded to the Database Table. You can click on **View Log** to view the log file for errors and upload status.

4.2 Forms Designer

> **NOTE** This functionality does not work when CSRF is enabled.

Forms Designer within the Data Entry Forms and Queries Section facilitates you to design Web-based User-friendly Forms using the pre-defined layouts. You can access DEFQ - Forms Designer by expanding **Data Management Framework** and **Data Entry Forms and Queries** within the tree structure of the LHS menu and selecting **Forms Designer**.

Figure 15: Forms Designer Window



The *DEFQ - Forms Designer* Window 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.

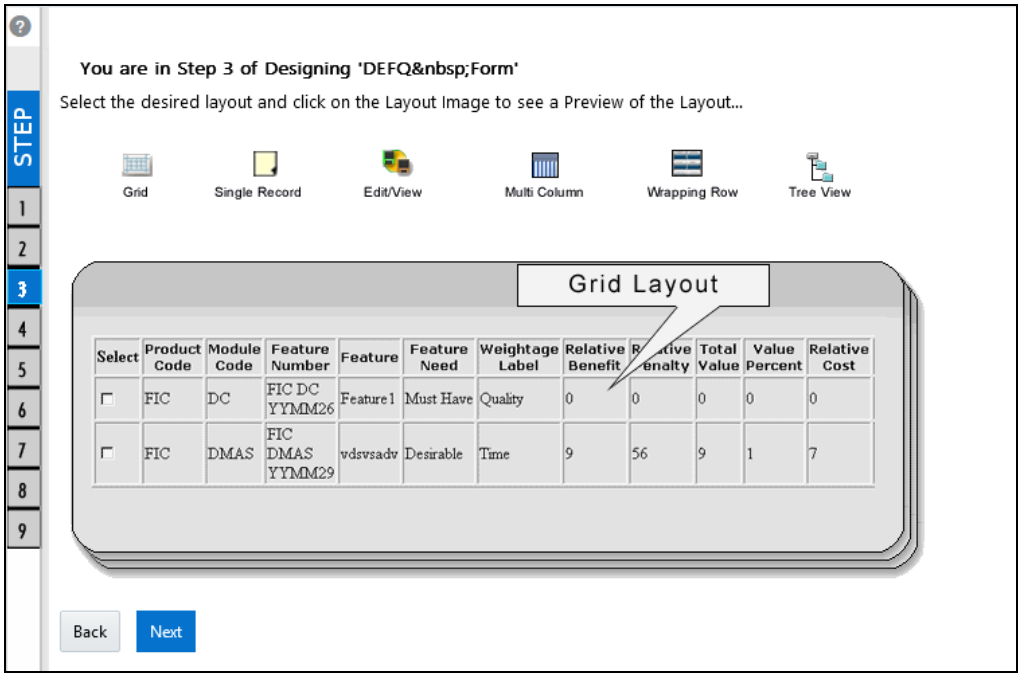
- Creating a New Form
- Altering Existing Forms
- Copying Forms
- Deleting Forms
- Assigning Rights
- Message Type Maintenance

4.2.1 Creating a New Form

To design a New Form in the *DEFQ - Forms Designer* Window:

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**.
2. Click **Next**.
   The *DEFQ - Layout* Window is displayed with a range of pre-defined layouts for you to choose from.

Figure 16: DEFQ – Layout Window (Step 3 of Designing Form)



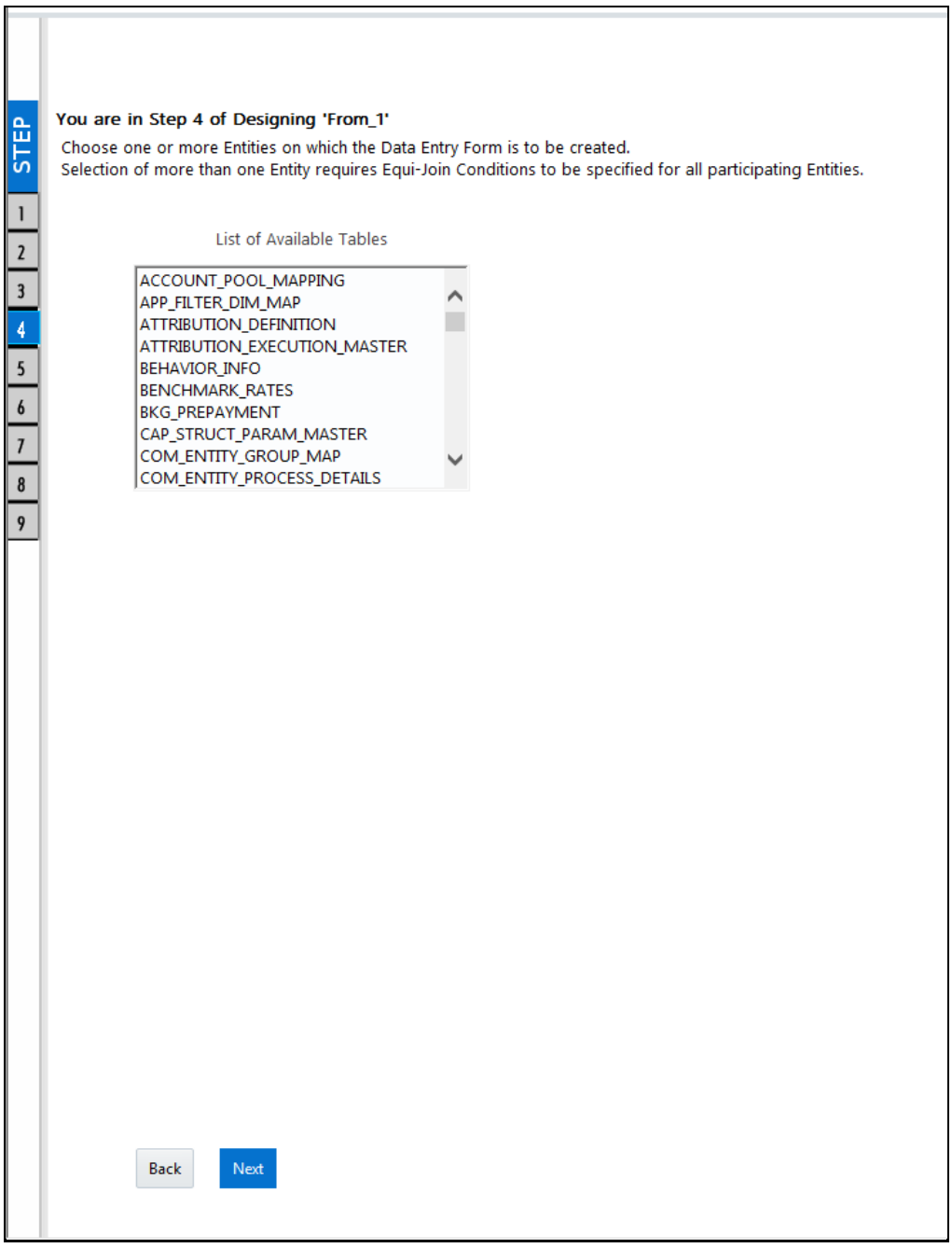
The following table describes the layouts in the DEFQ – Layout Window.

Figure 17: Layouts in the DEFQ – Layout Window and their Description

Layout	Description
Grid Layout	It is the default layout that displays the records in the Form of a table/grid with multiple rows of data.
Single Record Layout	It displays a single record at a time.
Edit/View Layout	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. **Note**: The column names are editable only during altering the created Form.
Multi-Column Layout	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.
Wrapping Row Layout	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.
Tree View Layout	It displays the Hierarchical dimensional table with the selected dimension details. You can select the following options: Dimensional Table Tree Parent-Child Tree **Note**: The process to create a Form using the Tree View Layout differs from the procedure explained below. For more information, refer Create Tree View Form in the References section.

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.

Figure 18: DEFQ – List of Available Tables Selection Window (Step 4 of Designing Form)



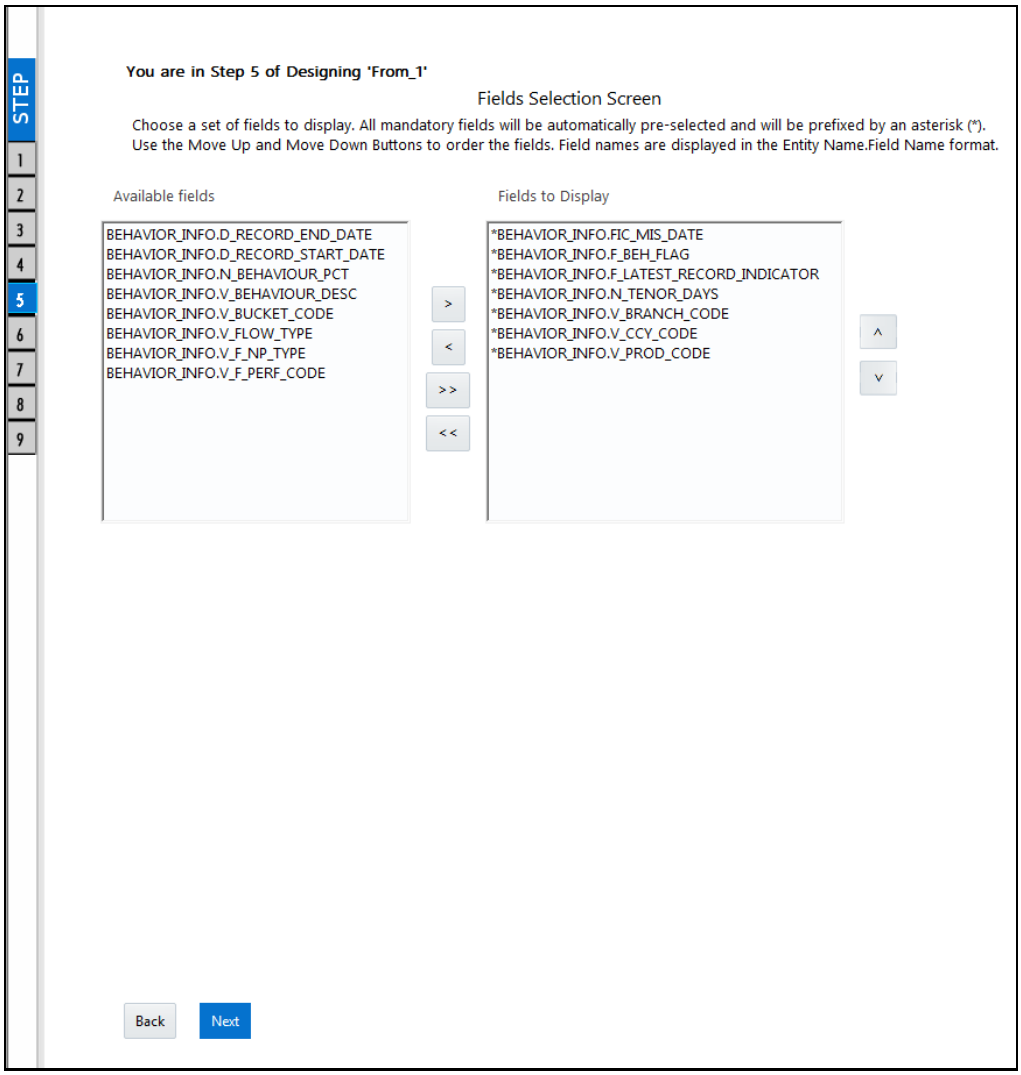
NOTE You should use tables with names not longer than 25 characters. This is a limitation.

For multiple selections, you can either press the **Ctrl** key for nonadjacent selection or the **SHIFT** key for adjacent selections. Click **Next**, the *Fields Selection* Window is displayed.

NOTE If multiple tables are selected, you need to specify Join Conditions. 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 the *Fields Selection* Window is displayed.

5. Select the fields to be joined from the **Available Fields** list and click the Move icon. You can press the **Ctrl** key for multiple selections and also click Move All icon to select all the listed fields. All mandatory fields are auto-selected and are indicated on the window with an asterisk (*****).

Figure 19: DEFQ – Fields Selection Window (Step 5 of Designing Form)



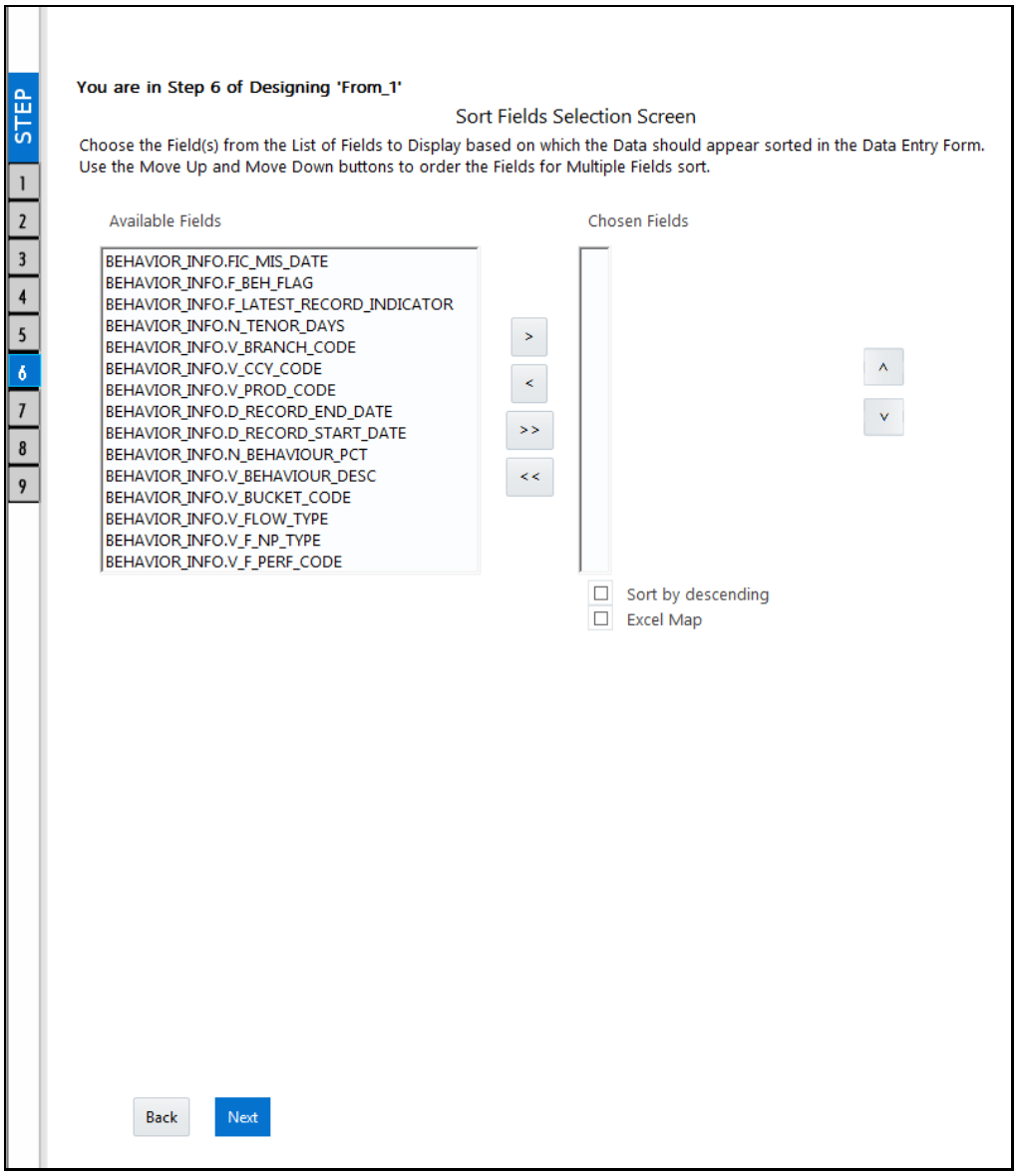
NOTE

You can click ^ or v 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.

Ensure the fields selected are not of CLOB Data Type since it is not supported in DEFQ.

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

Figure 20: DEFQ – Sort Fields Selection Window (Step 6 of Designing Form)



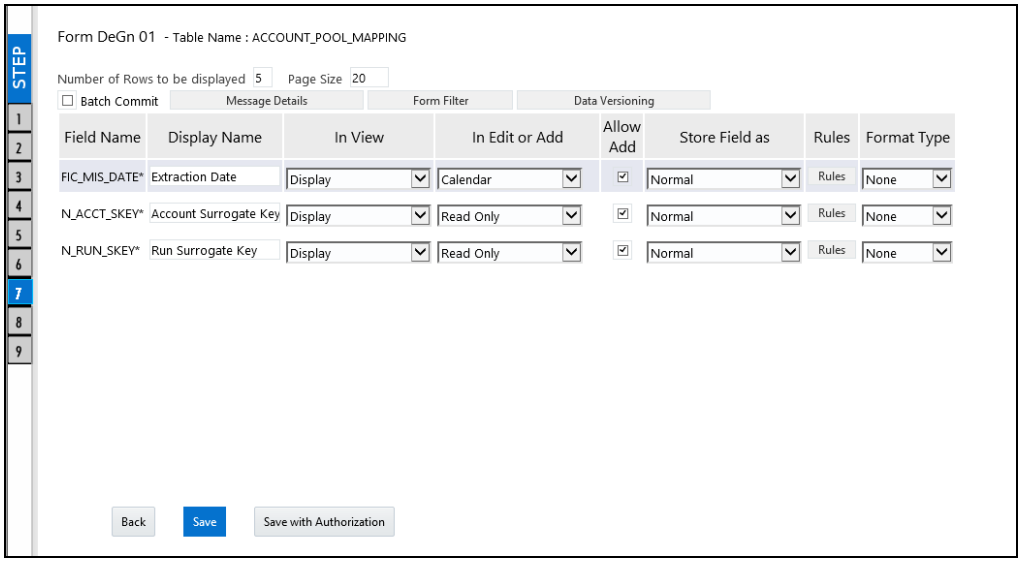
You can sort the fields in the required order as intended to display in the Data Entry Form. Additionally, the mandatory fields which need user inputs are indicated in the '*' symbol and are auto-selected in the Selected Fields Pane.

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

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

7. Click **Next**. The *DEFQ Field Properties* Window 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.

Figure 21: DEFQ – Field Properties Window (Step 7)



Specify the parameters for each field as tabulated.

The following table describes the fields in the DEFQ – Field Properties Window.

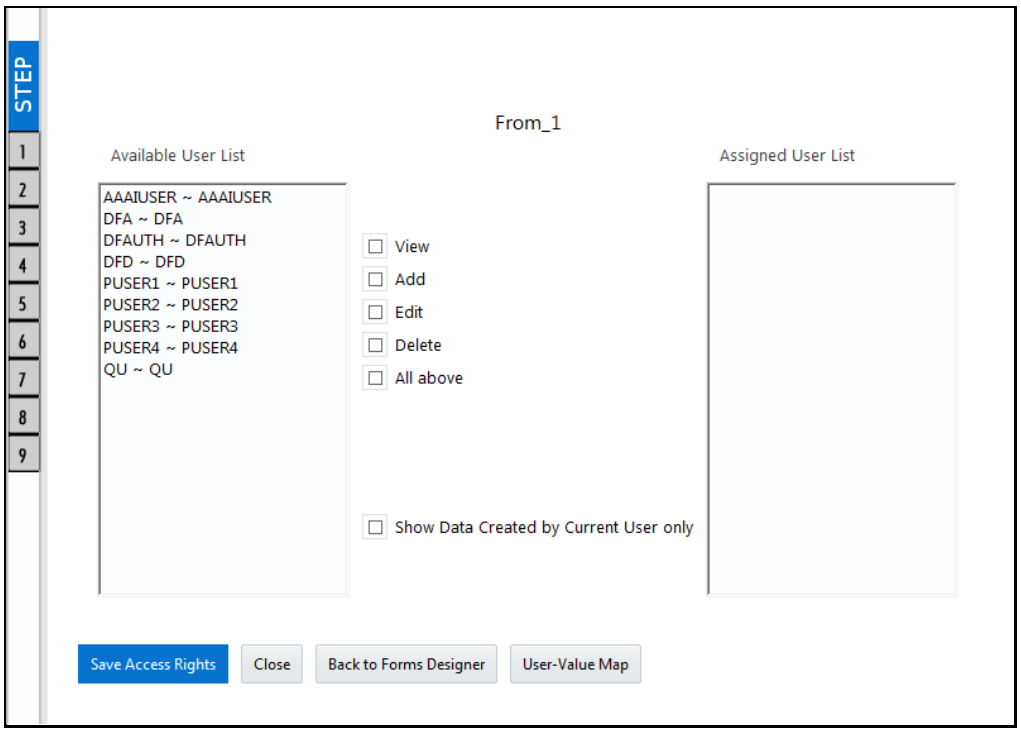
Figure 22: Fields in the DEFQ – Field Properties Window and their Description

Field	Description
Display Name	Edit the default Display Name if required.
In View	Select either Display or Do not Display to display the field in the Form. 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; Same Field Alternate Display Field Do not Display Options

Field	Description
In Edit/Add	Specify the edit parameters by selecting from the drop-down list. The available options depend on the type of field selected. For normal fields, you can select Text Field, Text Area, Select List, Protected Field, Read-Only, and Do Not Show. For foreign key fields s you can select Read-Only, Select List, and Do Not Show. For primary key fields, you can select Read Only and Do Not Show. For calendar fields, you can select Calendar and Do Not Show. **Note**: If you choose the **Select List** option, you need to define the values. For more information, see Define List of Values.
Allow Add	Select the check box to permit users to add a new record. **Note**: An alert message is displayed if you are trying to save a Form with add option disabled for the mandatory fields.
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 *Sort Fields Selection* Window).
Rules	Click **Rules** and specify Rules and Expressions for the selected field in the *Specifying Rules and Expressions for Data - Validations* Window. For more information, refer Applying Rules section in the References.
Format Type	Select the required Format type from the drop-down list depending on the field type selected. CLOB data type is not supported.
Batch Commit	Select the check box to group all the sets of table Forms into 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 **Message Details** to define the message type for Creator and Authorizer in the *Messaging Details for a Form* window. For more information, see Define Message Details.
Form Filter	Click Form Filter to define an expression for Form-level filter condition in the *Filter for Form* Window.
Data Versioning	Click **Data Versioning** to perform data versioning on an authorized Form. For more information, see Form Data Versioning.

8. Click either **Save** to only save the Form details or click **Save for Authorization** to save the changes with authorization.
   For more details, refer Save with Authorization Section.

Figure 23: DEFQ – Save Window



NOTE Sometimes, on clicking **Save**, the form does not get saved. This is because the Java heap size setting for the OFSAAI service is set too high and the webserver 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/.

While saving, the *User for Mapping - DEFQ* Window is displayed which facilitates you to assign user rights to the Form. For more information, see Assign Rights.

4.2.2 Altering Existing Forms

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

1. 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.
2. Click **Next**. The *Fields Selection* Window 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 the Display list and click < to de-select. You can press the **Ctrl** key for multiple selections and also click » or « buttons to select/deselect all the listed fields.

3. Click **Next**.
   The *Sort Fields Selection* Window 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/deselect all the listed fields.
   - Select a field and click ^ or v buttons to arrange fields in the required order.
   - (Optional) To arrange multiple fields, select the **Sort by Descending** check box.
   - (Optional) Select the **Excel Map** check box to enable Bulk Authorization.

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

4. Click **Next**. The *DEFQ Field Properties* Window is displayed.
   Modify the parameters for each field as required. See DEFQ Field Properties details.
5. 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* Window is displayed which facilitates you to assign user rights to the Form. For more information, see Assign Rights.

4.2.3 Copying 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* Window:

1. Select **Copy Forms** from the available options and do the following:
   - Select the application from the **From Application** drop-down list which consists 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.

4.2.4 Deleting Forms

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

1. Select **Delete Forms** from the available options and do the following:
   - Select the application from the **Available Application** drop-down list which consists 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**.

4.2.5 Assigning Rights

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

1. Select **Assign Rights** from the available options and do the following:
   - Select the required application from the **Available Applications** drop-down list.
   - Select the required form for which you want to assign rights to a user from the **Available Forms** drop-down list.
2. Click **Next**.
   The *DEFQ- Assign Rights* Window is displayed.
3. Select the required user from the **Available User List**.
   You can also click < or > buttons to reload the previous/next set of users in the list.
4. Select the check box corresponding to the user permissions such as **View**, **Add**, **Edit**, **Delete**, or **All Above**. You must give View permission to allow users to Edit or Delete a Form.
5. Select **Authorize** or **Auto-Authorize** check box 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** permissions, the data entered by the user is auto authorized and the data will be in **Authorized** status. In the 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 the *Data Entry* window and not through the *Excel Upload* Window.

6. Select the **Show Data Created by Current Users Only** check box if you want the current user to view data created by him only.
7. Click **User Value Map** to map users to the form based on the Data Filter.

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

User Value Map

This feature allows you to create a Data Filter based on any field/column of the table you selected for designing the Form. When a user tries to access the form in the *Data Entry* Window, data will be filtered and displayed based on the selected field, to the users associated with that column.

> **NOTE** The data type of field/column you select to define the filter should be NUMBER or VARCHAR. The users mapped to the DEFQ form whose assign rights are authorized through "Forms Authorization" can save the filter.

There are two types of filters, Global Data Filter and Custom Data Filter.

Global Data Filter: In this filter, the value will be fetched from the DEFQ_GLOBAL_VALUES table of the Atomic Schema, which is automatically created during information domain creation. The table needs to be populated manually through excel upload. The table contains all the entities and the users mapped to them.

Custom Data Filter: This filter enables the user to provide a custom filter for the form you design. In this filter, you should enter values for all the users mapped to the form manually.

To set a Data Filter:

1. Click **User Value Map** in the *DEFQ- Assign Rights* Window.

   The *User Value Map* Window is displayed.

2. Select the **Global Data Filter** option to filter the data globally.
   - Select the field based on which the data should be filtered and displayed for the user, from the Fields to the Display Section.

> **NOTE** Normally the user can access all the data from the table whenever the DEFQ Form is created. Based on this filter, the user will be displayed only the data which is mapped to him.

3. Select the **Custom Data Filter** to provide a custom filter for a specific DEFQ Form.
   - Select **User ID** from the drop-down list and enter **Values** for that user. It is mandatory
4. Click **Save.**

4.2.6 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* Window. Message Type details can be defined while creating a Form. For more information, see Define Messaging Details.

In the *DEFQ - Forms Designer* window, do the following:

1. Select **Message Type Maintenance** from the available options and click **Next**.

   The *DEFQ - Message Type Maintenance* Window 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** are auto-populated. Edit the details as required.
   - Add or remove the defined recipients. Double-click on the required member to toggle between the **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.

4.3 Forms Authorization

> **NOTE** This functionality doesn't work when CSRF is enabled. To disable CSRF, see the *Update General Details* section in the OFS Analytical Applications Infrastructure User Guide.

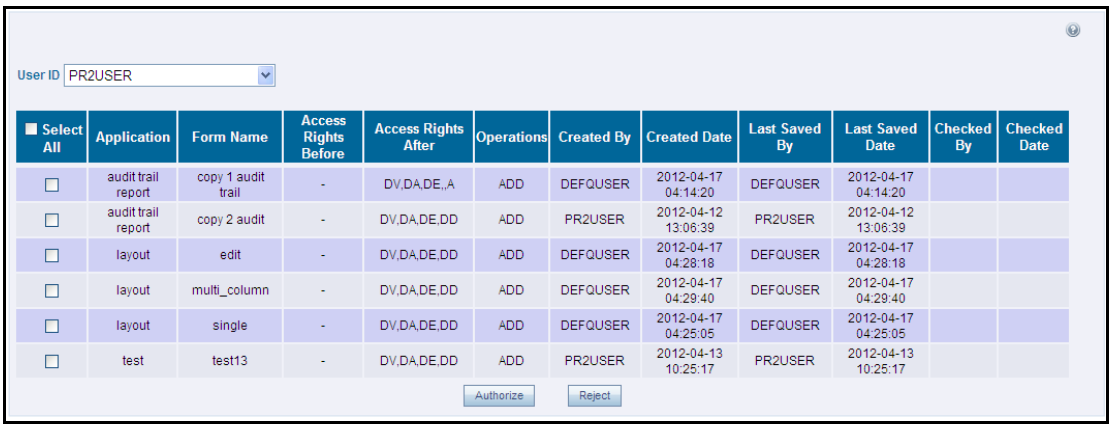
Forms Authorization within the Data Entry Forms and Queries section of the Infrastructure System facilitates you to view and authorize/approve any changes that are made to the privileges assigned to a user in a particular Form.

You need to have the **FRMAUTH** function role mapped to access the *Forms Authorization* Window.

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

You can access the *Forms Authorization* Window from the left-hand side (LHS) menu of the Infrastructure home page. Click "+" and expand the Data Model Management and select **Data Entry Forms and Queries**.

Figure 24: Forms Authorization Window



The *Forms Authorization* Window 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* Window allows you to select a user from the drop-down list adjacent to the **User ID** Field. This field displays the User IDs associated with the selected Information Domain.

On selecting a user from the **User ID** Field, the columns in the *Forms Authorization* Window lists the grants requested for that user on different Forms as listed below.

4.3.1.1.1 DEFQ Field Properties

The following table describes the columns in the Forms Authorization Window.

Figure 25: Column Names in the Forms Authorization window and their Description

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. **Note**: For the new Form, the column remains blank.
Access Rights After	Displays the Right Requests raised for authorization. **DV** - DEFQ VIEW **DA** - DEFQ ADD **DE** - DEFQ EDIT **DD** - DEFQ DELETE **A** - AUTHORIZE **DU** - AUTO AUTHORIZE **S** - SHOW DATA CREATED BY CURRENT USER ONLY
Operations	Displays the operation carried out in the Form. For example, "**ADD**" 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.

Column Name	Description
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* Window:

1. Select the **User ID** from the drop-down box. 4B43BThe Right Requests submitted on various forms are displayed.
2. Select the check box(s) adjacent to the requests to authorize/reject.

   You can also select all the requests at once for a user, by clicking the **Select All** check box.
3. Click **Authorize / Reject** to authorize or reject the selected Right Requests.

   After the Form action privileges are authorized for a user, 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.

> **NOTE** Special characters are not allowed in DEFQ Definitions except underscore (_).

4.4 Data Entry

> **NOTE** This functionality doesn't work when CSRF is enabled. To disable CSRF, see the *Update General Details* section in the OFS Analytical Applications Infrastructure User Guide.

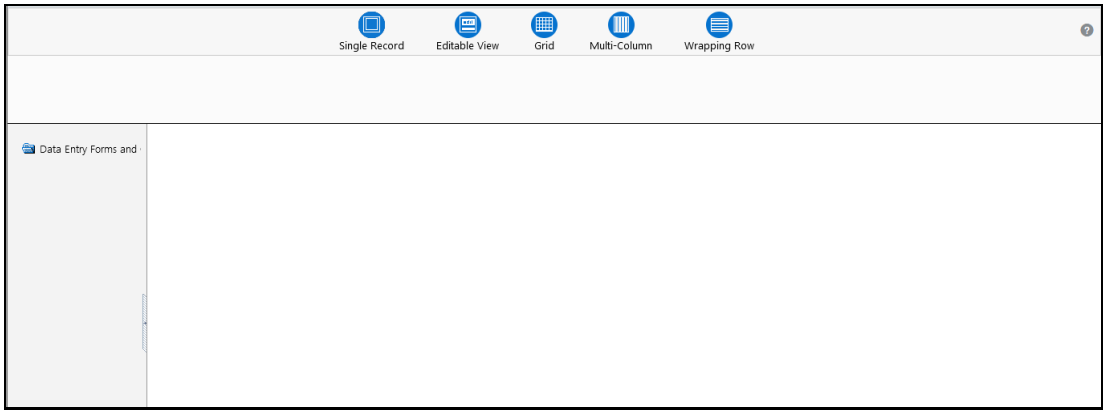
Data Entry within the Data Entry Forms and Queries section of the Infrastructure system facilitates you to view, add, edit, copy, and delete data using the various layout formats and Authorize/Re-authorize Data Records based on the permissions defined during the Form creation.

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 the *Data Entry* Window using the URL to search and update records, simultaneously.

You can access DEFQ - Data Entry by expanding the Data Entry Forms and Queries section of the Data Model Management Module within the tree structure of the LHS Menu.

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

Figure 26: DEFA – Data Entry Window



The *DEFQ - Data Entry* Window 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* Window, you can do the following:

- Viewing Form Details
- Editing Form Details
- Adding Form Data
- Authorizing Records
- Exporting Form Data
- Copying Form Data
- Deleting Form Details

4.4.1 Viewing Form Details

The *DEFQ - Data Entry* Window 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* Window, the following layout types are available. You can click on any of the following layouts to view the Form details. The buttons that are the **Previous Page**, **Back**, **Next**, and **Next Page** helps you to navigate through the records. However, the customized header sorting does not apply when you have navigated to Previous or Next pages.

> **NOTE** The **Roll Back** option can be used only for authorized records that are after the records are edited and saved, you can roll back/undo the changes in View Mode.

The following table describes the Layouts in the DEFQ – Data Entry Window.

Figure 27: Layouts in the DEFQ – Data Entry Window and their Description

Layout	Description
Single Record	To view the details of a single record at any given point. You can use the navigation buttons to view the next record in the table.
Editable View	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 **Display Rows**. You need to select the required record from the list to view/edit and click **Save** to update the changes.
Grid (Default)	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 **Display Rows**. You can click on the column header to alphabetically sort the list of records in the table.
Multi-column	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.
Wrapped Rows	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.

4.4.2 Searching Records

In the *DEFQ - Data Entry* window, 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* window:

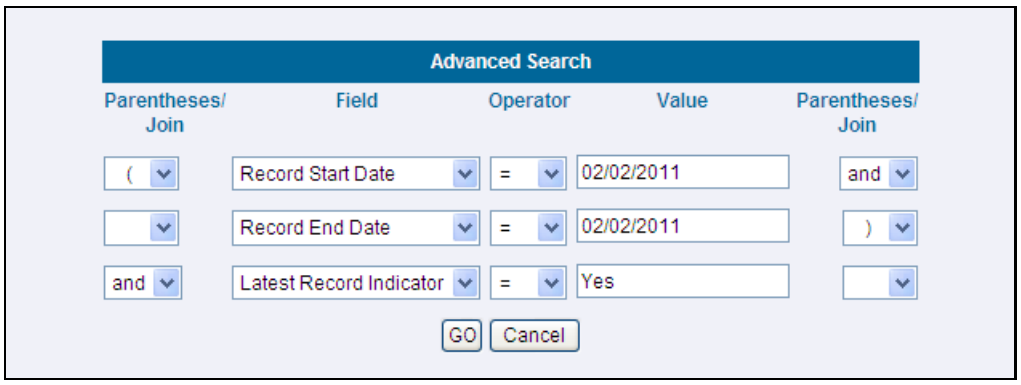
1. Click 

. 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* Window:

5. Click  within the Search fields. The *Advanced Search* Window is displayed.

Figure 28: Advanced Search Window



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

4.4.3 Editing Form Details

You can edit the permitted Form Field Values in the *DEFQ - Data Entry* Window. However, you cannot modify the primary key fields which are displayed in a non-editable format.

To edit Form Details in the *DEFQ - Data Entry* Window:

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.
4. 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. After 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, that is records that are updated and saved.

4.4.4 Adding 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* Window:

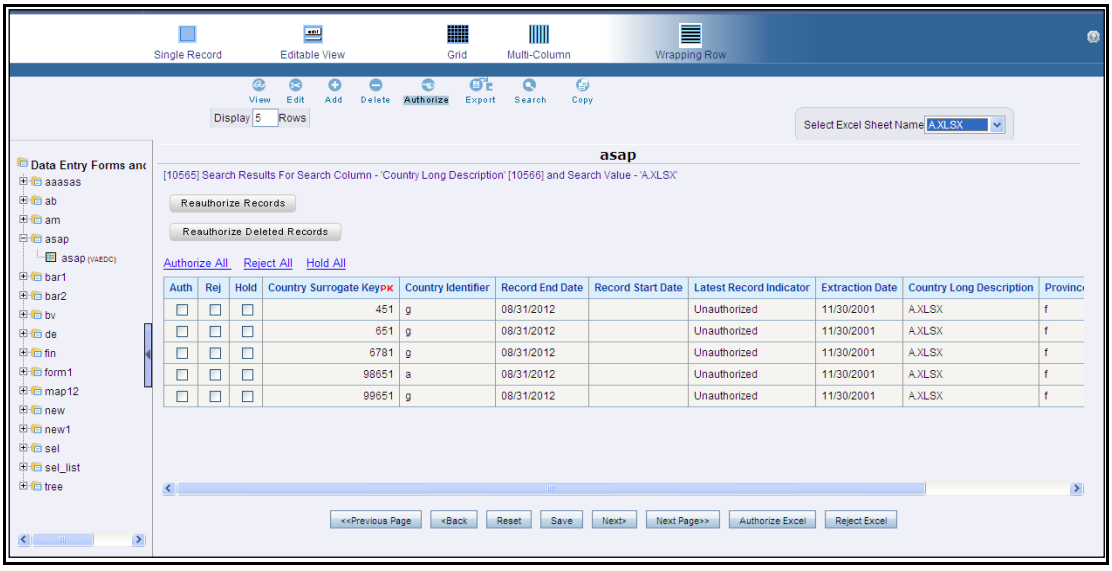
1. Open the required Form in View Mode and click Add.

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

4.4.5 Authorizing 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 within the *DEFQ - Data Entry* Window. You can Authorize a record in a table that 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.

Figure 29: DEFQ - Data Entry Authorization Window



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* Window:

1. Open the required Form in view mode and click 

.

   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" check box 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* window. Select the mapped Excel Name from the "SelectExcelSheetName" drop-down list. The

DEFQ - Data Entry Window displays only those records which are uploaded through 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 check box 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* window. Select the mapped Excel Name from the "SelectExcelSheetName" drop-down list. The *DEFQ - Data Entry* Window 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 check box in the "**Hold**" column adjacent to the required record and click **Save**.

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

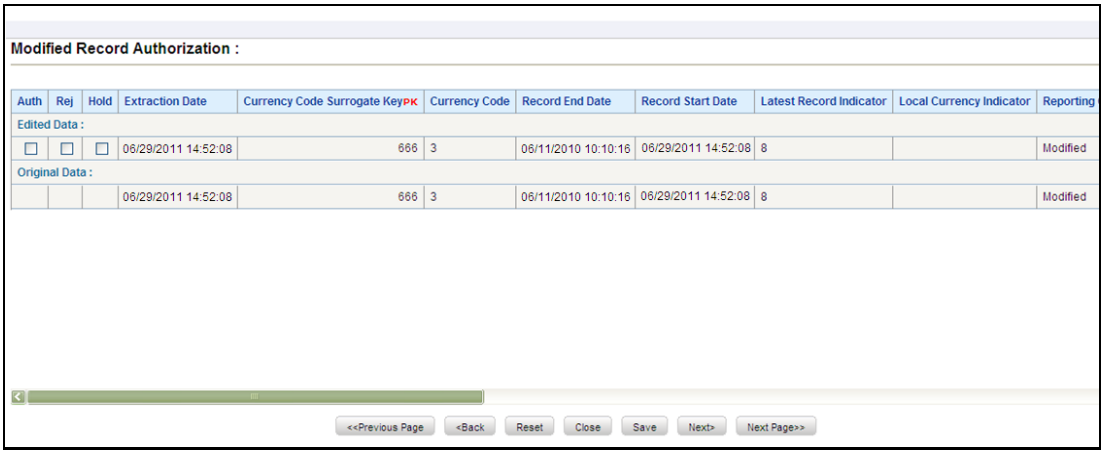
- Click **Authorize All** and click on **Save** to authorize all the records displayed on the Current Page.
- Click **Reject All** and click on **Save** to reject all the records displayed on the Current Page.
- Click **Hold All** and click on **Save** to hold all the records displayed on the Current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

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

4.4.5.1 Re-authorizing Records

You can re-authorize an Authorized Record that 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.

Figure 30: DEFQ - Data Entry Re-Authorize Window



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

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.

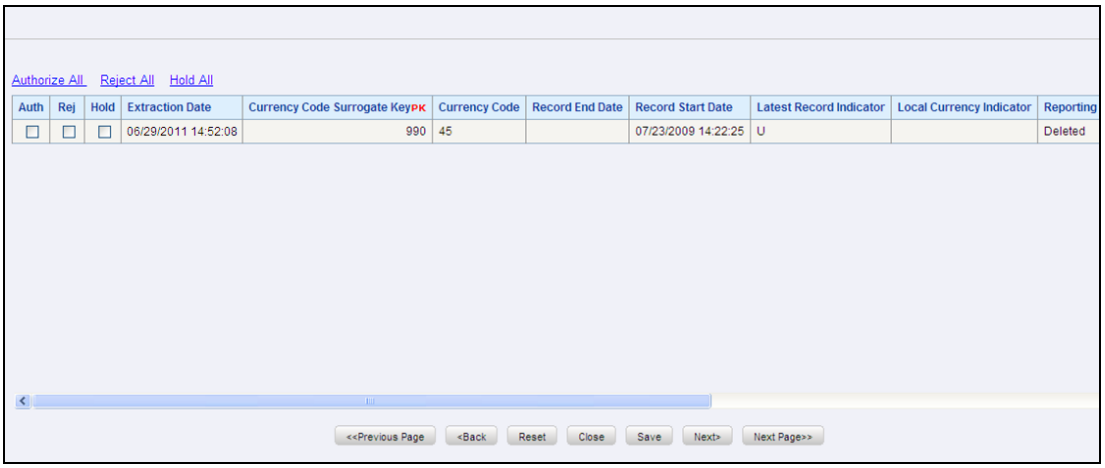
2. Click **Reauthorize Records**.
   The *DEFQ Authorization* Window is displayed.
3. Select the "Auth" check box adjacent to the required record.
4. Click **Save**.
   On re-authorization, a confirmation message is displayed.

   You can also select the check box 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.

4.4.5.2 Re-authorizing 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.

Figure 31: DEFQ - Data Entry Re-Authorize Deleted Records Window



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

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" check box adjacent to the required record.
4. Click **Save**.
   On re-authorization, a confirmation message is displayed.

   You can also select the check box 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.

4.4.6 Exporting 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* Window:

1. In the View mode, select the check box adjacent to the record(s) which you want to export.
2. Click 

.
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.

4.4.7 Copying 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* Window:

1. Open the required Form in view mode and click 

.
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.

4.4.8 Deleting Form Details

You can remove Form details that are no longer required by deleting them from the *DEFQ - Data Entry* Window.

1. In the View mode, select the check box 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.

4.4.9 References

This section of the document consists of information related to intermediate actions that need to be performed while completing a task. The procedures are common to all the sections and are referenced where ever required. You can see the following sections based on your need.

4.4.9.1 Creating Tree View Form

The process to create a Form using the Tree View Layout differs from the procedure as explained for other layouts. You can create a Form using the Tree View Layout, by selecting either Dimensional Table Tree or Parent-Child Tree.

4.4.9.2 Dimensional Table Tree

If you want to create a Form using the Dimension Table Tree, select **Tree view** > **Dimension Table Tree** option in the *DEFQ - Layout* Window. On clicking **Next**, you need to provide the required details in the following windows:

1. **Dimension Table Selection**: Enter the **Root Name** and select the Table. Click **Next**.
2. **Fields Selection**: Select required Fields to Display from Available fields and click **Next**.
3. **Dimension Node Selection**: Select Field Nodes from Available fields and click **Next**.
4. Select Dimensional Tree Nodes for the selected fields and click **Next**.
5. **DEFQ Field Properties** Window: Specify the required details. For more information, see DEFQ Field Properties.

4.4.9.3 Parent-Child Tree

If you want to create a Form using the Parent-Child Tree, select **Tree view** > **Parent-Child Tree** option in the *DEFQ - Layout* Window. On clicking **Next**, you need to provide the required details in the following windows:

1. **Hierarchy Table** Selection: Enter the **Root Name** and select the Table. Click **Next**.
2. **Parent-Child Node Selection**: Select Parent Node, Child Node, and Node Description from the drop-down list.
3. **Fields Selection**: Select required Fields to Display from Available fields and click **Next**.
4. **DEFQ Field Properties window**: Specify the required details.
   For more information, see DEFQ Field Properties.

4.4.9.4 Applying Rules

You can apply rules to Validate Form Data to specific fields such as Text Field, Text Area, or Protected Field. To specify rules for a field in the *DEFQ - Forms Designer DEFQ Field Properties* Window:

1. Click **Rule** adjacent to the required field. The *Specifying Rules and Expressions for Data Validations* Window is displayed.
2. Select the required Fields, Operators, and Functions from the list.
3. Enter the Rule Expression in the Expression Viewer field.
4. Depending on the data type of the selected field, the following column constraints are displayed. Select the required check box.
   - No Spaces
   - Characters Only
   - Alpha Numeric

- Not Null
- Non Negative

5. Select the **Alignment** type from the drop-down list.
6. Click **OK** and save the details.

4.4.9.5 Defining List of Values

While creating a Form, if you choose the **Select List** field parameter option in the In Edit/Add column in the *DEFQ Field Properties* Window, you need to define the list of values in the *Select List* Window. However, you do not need to define the values for foreign key fields and primary key fields.

In the *Select List* Window, select the required Field Type from the following options:

- **Comma Separated Values**: Supports only the user-specified values while creating a Form.
- **Dynamic List of Values**: Supports field name from a table and stores it in the database. The same can be used during Data Entry.

If **Comma Separated Values** is selected:

1. Enter the **List of Values** to be displayed.
2. Specify **Alternate Display Values** to be displayed.
3. Click **OK** and save the specified list of values.

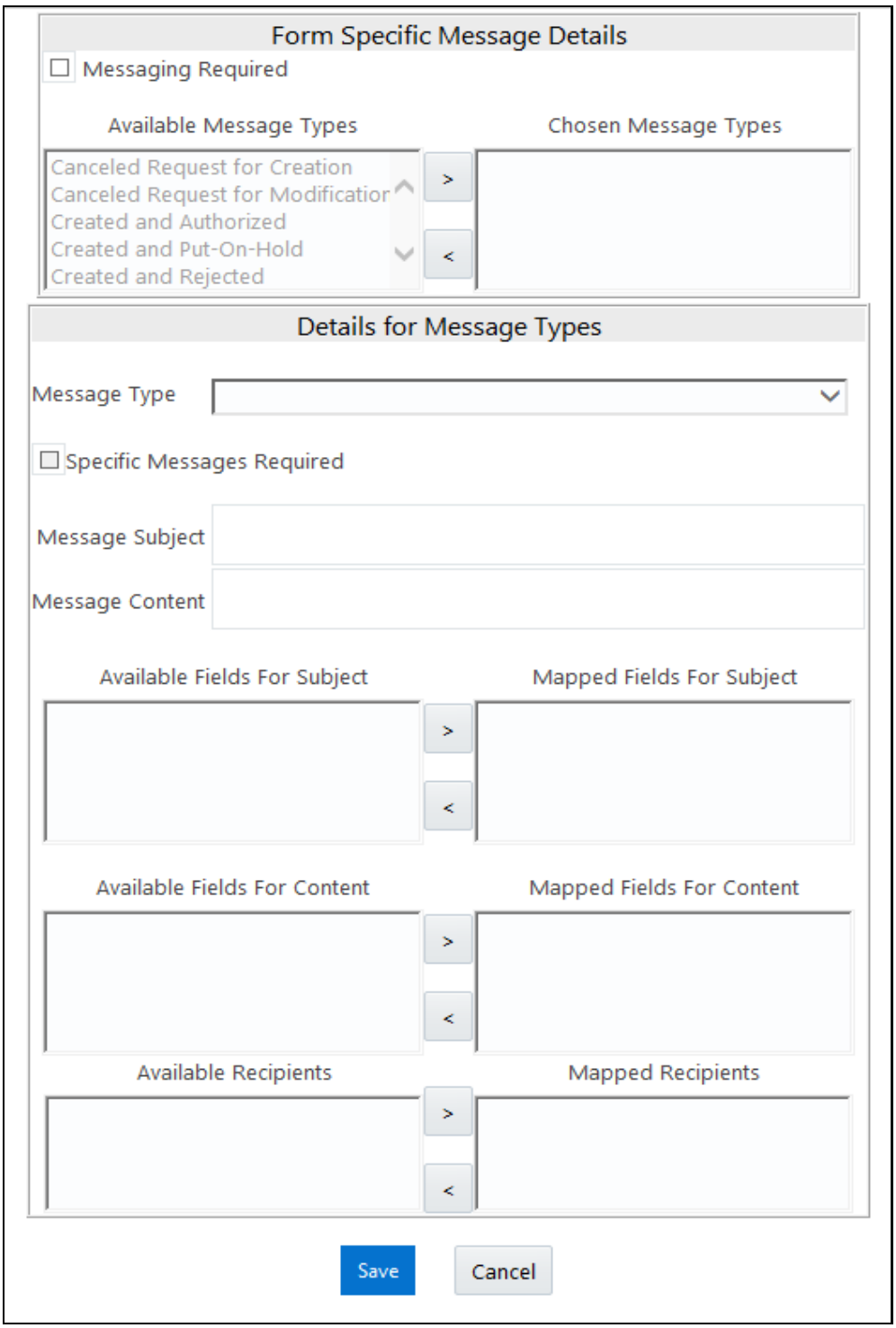
If **Dynamic List of Values** is selected:

1. Select Table Value, List Value, and Display Value field.
2. Select the Field, Operator, and Functions from the list.
3. Define a filter condition for the selected values.
4. Click **OK** and save the specified list of values.

4.4.9.6 Defining Messaging Details

While creating a Form, you can click **Message Details** in the *DEFQ Field Properties* Window to define the messaging details. You can specify an alert message which is sent to the Creator of the Form or an Authorizer.

Figure 32: Messaging Details window



In the *Messaging Details for a Form* window:

1. Select **Messaging Required** check box to activate the Messenger feature.

> **NOTE** If the option is not selected, a single mail is sent for the entire batch. Message details such as recipients, subject, and contents are fetched from the metadata.

2. Select the required **Available Message Types** from the list and click ›.
3. Select the **Message Type** from the drop-down list based on a specific action.
4. Select **Specific Messages Required** to add a specific message.
5. Select Available Fields for **Subject**, **Content**, and **Recipients** from the list and click ›.
6. Click **Save** and save the messaging details. You also need to select **Save with Authorization** in the *DEFQ Field Properties* Window for the messages to be functional.

4.4.9.7 Form Data Versioning

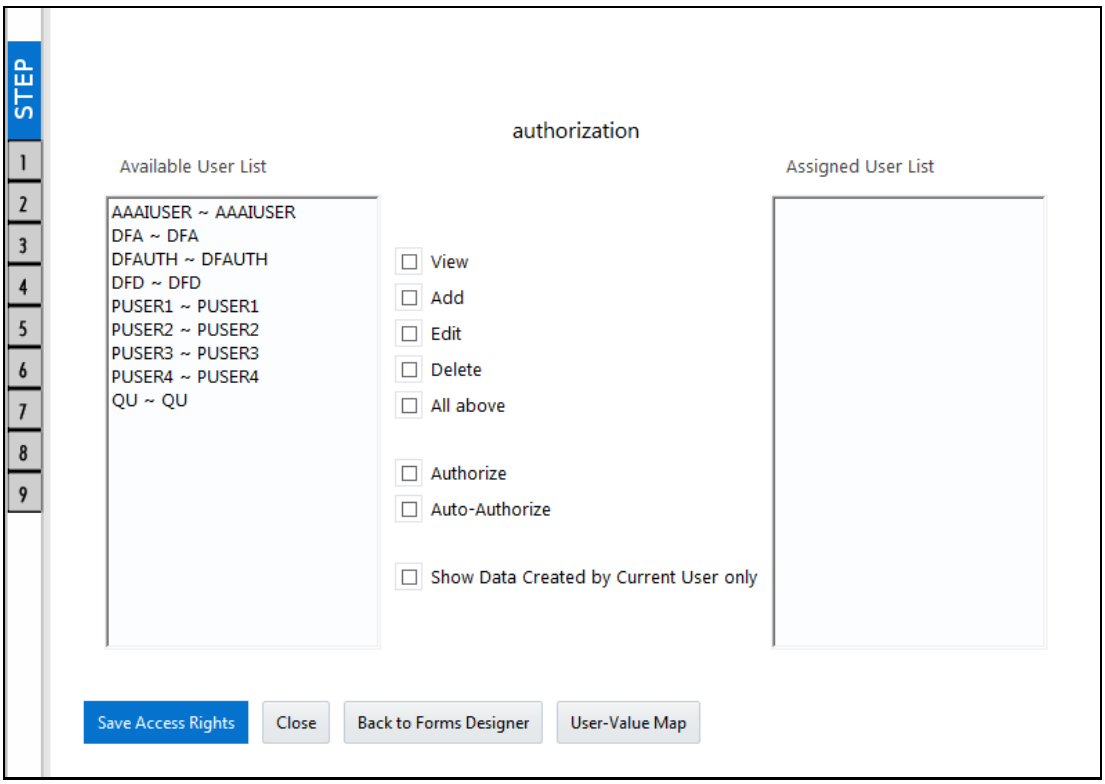
You can perform data versioning on an Authorized Form. The modifications made to the particular Form are tracked and displayed as per date versioning. In the *Data Versioning for Form* Window, do the following:

1. Select **Enable Data Versioning** check box to ensure that the version is tracked.
2. Select the **Table** and **Version Identifier** from the drop-down list.
3. Click **OK** and save the versioning details.

4.4.9.8 Save with Authorization

The **Save with Authorization** feature in Forms Designer (*Sort Fields Selection* Window) allows you to authorize the uploaded data. Authorization serves as a checkpoint for the validation of uploaded data.

Figure 33: DEFQ – Data Entry Save Authorization Window



To authorize the uploaded data, you need to create a Form in DEFQ with the **Save with Authorization** check box selected.

1. Before any DEFQ Form is created to authorize the data, the underlying table in the Data Model needs to have the below columns added to its table structure. You need to perform a Data Model Upload to have the new structures reflected in the application.

   Columns required:

   ```
   V_MAKER_ID VARCHAR2(20),
   V_CHECKER_ID VARCHAR2(20),
   D_MAKER_DATE DATE,
   D_CHECKER_DATE DATE,
   F_AUTHFLAG VARCHAR2(1),
   V_MAKER_REMARKS VARCHAR2(1000),
   V_CHECKER_REMARKS VARCHAR2(1000)
   ```

2. Navigate to Create a New Form in the Forms Designer Section and complete the design steps up to Step 6. From the *DEFQ Field Properties* Window explained in step 7, select the appropriate values as listed below for **Store Field As** depending on the columns selected:

   ```
   V_MAKER_ID - MakerID
   V_CHECKER_ID - CheckerID
   D_MAKER_DATE - Maker Date
   D_CHECKER_DATE - Checker Date
   ```

F_AUTHFLAG - AuthFlag

V_MAKER_REMARKS - Maker Remarks

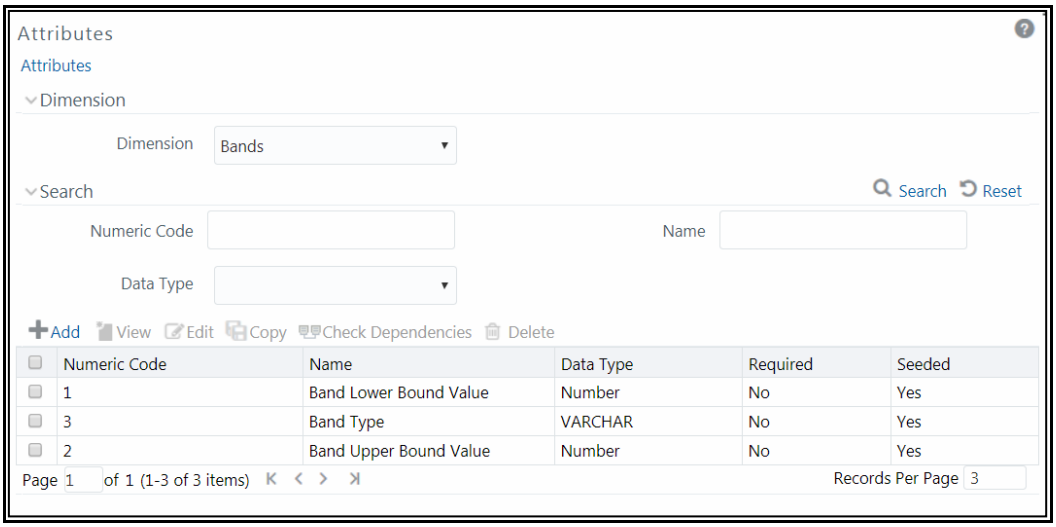
V_CHECKER_REMARKS - Checker Remarks

3. Click **Save with Authorization**. After the data is loaded into the table, you can log in as 'Authorizer' and navigate to the *Data Entry* window. Select the Form to open and authorize the records loaded.

5 OFSAA Attributes

Attributes refer to the distinguished properties or qualifiers that describe a Dimension Member. Attributes may or may not exist for a simple dimension. Attributes Section is available within the Dimension Management Section of the Financial Services Applications Module.

Figure 34: Attributes Window



The *Attributes* Window displays the list of pre-defined Dimension Attributes with the other details such as the Numeric Code, Name, Data Type, Required, and Seeded. You can search for a specific Attribute based on Numeric Code, Name, or Data Type and view the list of existing definitions within the system.

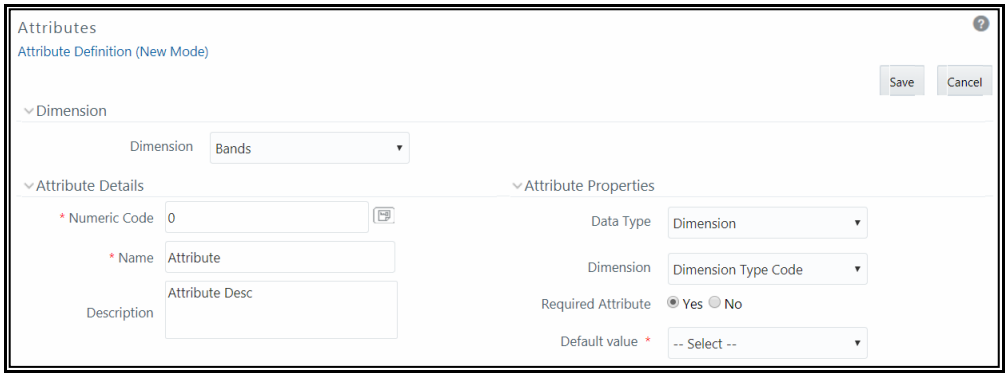
5.1 Adding Attribute Definition

Attributes facilitate you to define the properties or qualifiers for the Dimension Members. The Write role should be mapped to your user group, from the *User Group Role Map* Window.

To create an Attribute definition in the *Attributes* Window:

1. From the *Attributes* window, click **+ Add**. The *Attribute Definition (New Mode)* Window is displayed.

Figure 35: Attributes Window



2. In the Dimension Section, select the required dimension from the drop-down list.
3. Click the  button in the **Numeric Code** Field. A unique code is auto-generated.

   You can also manually enter the code in the **Numeric Code** Field.
4. Enter the **Name** and required **Description** for the Attribute.

> **NOTE** Name: The characters & ' " are restricted in the Name Field.
>
> Description: The characters ~&+' "@ are restricted in the Description Field.

5. Enter the Attribute Window is as tabulated:

The following table describes the fields in the Attribute Window.

Figure 36: Fields in the Attributes Window and their Descriptions

Field	Description
Fields marked in red asterisk (*) are mandatory.	
Type	Select the **Data Type** as DATE, DIMENSION, NUMBER, or STRING from the drop-down list. If **NUMBER** is selected as the Data Type: The **Scale** field is enabled with "0" as the default value. Enter a Scale value >= 0. If it is left as 0, values for this attribute will be limited to Integers. If you wish to enable decimal entries for this attribute, the maximum Scale value must be > 0 and <= the scale defined for NUMBER_ASSIGN_VALUE in the dimension's underlying attribute table. See the OFS Data Model Utilities Guide for further details on the Attribute Table.
Required Attribute	Select **Yes** or **No**. If this is set to No, an attribute value is optional for the associated Dimension Members. **Note**: This field is disabled in Add and Edit modes if any members already exist for the Dimension on which this attribute is defined.

Field	Description
Default Value	If **Required Attribute** is set to **Yes**, a Default Value must be entered, otherwise it is optional. If **DIMENSION** is selected as the **Data Type**: Select the required Dimension from the drop-down list in the Dimension field. Select the **Default Value** from the drop-down list of members mapped to the selected Dimension. If the required Member is not listed in the drop-down then select **--More—**and the *Member Search* Window is displayed. If **NUMBER** is selected as the **Data Type**: Enter a numeric value in the Default Value field, and it must be consistent with the Scale you have defined. If **DATE** is selected as the **Data Type**: Click the button to select a valid date as the Default Value from the calendar. If **STRING** is selected as the **Data Type**: Enter an Alphanumeric Value in the **Default Value** field. The Maximum Number of characters allowed in the Default value field for String Data Type is 1000.

6. Click **Save**. The entries are validated and the defined Attribute is captured.

5.1.1 Viewing Attribute Definition

You can view individual Attribute Definition details at any given point. The Read-only role should be mapped to your user group.

To view the existing Attribute Definition details in the *Attribute* Window:

1. Select the check box adjacent to the Numeric Code of the Attribute, whose details are to be viewed.
2. Click **View** button in the Dimension Attributes Toolbar.

   The *View – Attributes* window is displayed with the details such as Dimension, Numeric Code, Name, Description, and Attribute Properties.

5.1.2 Modifying Attribute Definition

You can modify the Name, Description, or Default Value fields of an attribute definition. The Write role should be mapped to your user group.

To modify an existing Attribute Definition in the *Attributes* Window:

1. Select the check box adjacent to the Numeric Code of the Attribute, whose details are to be updated.

2. Click  **Edit** button in the Dimension Attribute toolbar. The **Edit** button is disabled if you have selected multiple Attributes. The *Edit - Attributes* Window is displayed.
3. Edit the Attribute details such as Name, Description, or Default Value. For more information, see Add Attribute Definition.
4. Click **Save** to save the changes.

5.1.2.1 Copying Attribute Definition

The Copy Attribute Definition facilitates you to quickly create a new Attribute Definition based on the existing attributes or by updating the values of the required attributes. The Write role should be mapped to your user group.

To copy an existing Attribute Definition in the *Attributes* Window:

1. Select the check box adjacent to the Numeric Code of the Attribute, whose details are to be duplicated.
2. Click  **Copy** button in the Dimension Attributes toolbar to copy a selected Attribute definition. **Copy** button is disabled if you have selected multiple Attributes.
3. In the *Copy – Attributes* Window you can:
   - Create a new attribute definition with existing variables. Specify new **Numeric Cod**e and **Attribute Name**. Click **Save**.
   - Create a new attribute definition by updating the required variables. Specify new **Numeric Cod**e and **Attribute Name**. Update the required details. For more information, see Add Attribute Definition. Click **Save**.

     The new attribute definition details are displayed in the *Attributes* Window.

5.1.3 Attribute Definition Dependencies

You can view the dependencies of Attributes. The Read-only role should be mapped to your User Group.

To view the dependency of an attribute in the *Attributes* Window:

1. Select the check box adjacent to the Numeric Code of the Attribute whose dependency is to be checked.
2. Click the  button in the Dimension Attributes toolbar. The **Check Dependencies** button is disabled if you have selected multiple attributes. The *Attributes Dependency Information* Window is displayed with the dependency details.

5.1.4 Deleting Attribute Definition

You can remove the Attribute Definitions which are not required in the system by deleting them from the *Attributes* Window. The Write role should be mapped to your User Group.

1. Select the check box adjacent to the Numeric Code(s) of the Attributes whose details are to be removed.

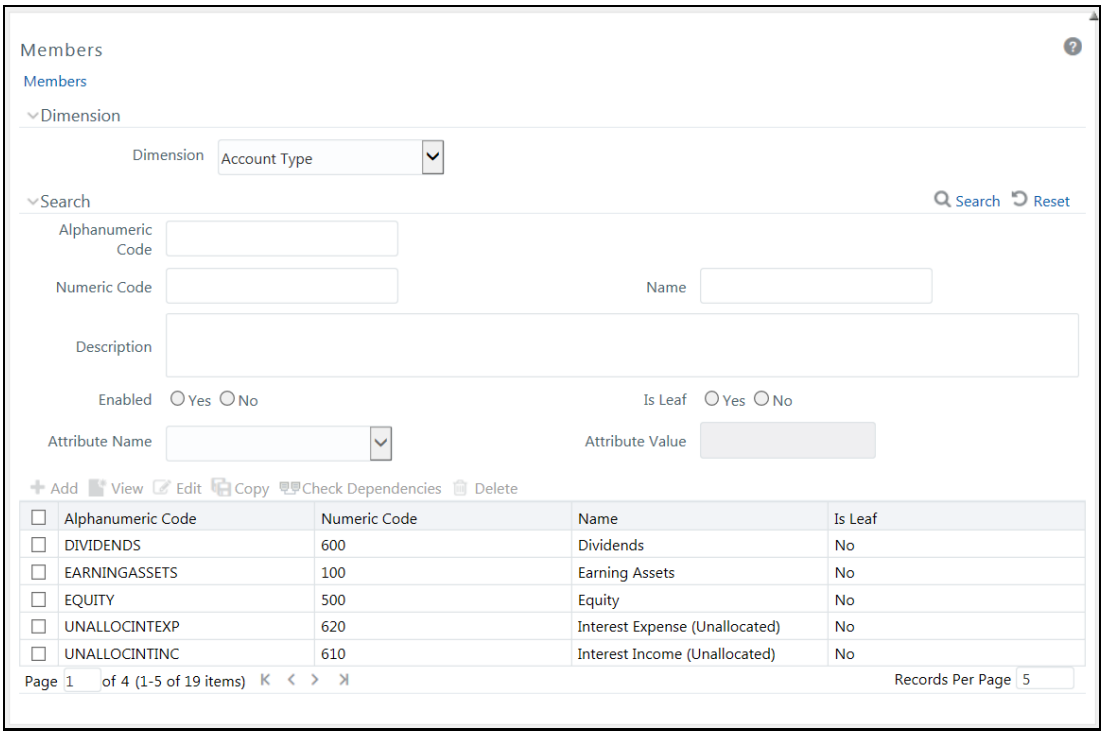
2. Click  **Delete** button in the Dimension Attributes Toolbar.
3. Click **OK** in the information dialog to confirm the deletion.

6 OFSAA Dimension Members

Dimension Members refer to the individual items that constitute a dimension when data is categorized into a single object. Example, Product, Organization, Time, and so on. Members are available within the Dimension Management Section of the Infrastructure System.

For more information on how to set up Alphanumeric and Numeric Codes, see Configurations to use Alphanumeric and Numeric Codes for Dimension Members section in OFSAAI Administration Guide.

Figure 37: Members Window



The *Members* Window displays the list of pre-defined Dimension Members with the other details such as the Alphanumeric Code, Numeric Code, Name, and Is Leaf. You can also search for a specific Member based on Alphanumeric / Numeric Code (irrespective of whether the dimension is configured to be Numeric or Alphanumeric), Name, Description, Enabled status, Is Leaf status, Attribute Name, or Attribute Value and view the list of existing definitions within the system.

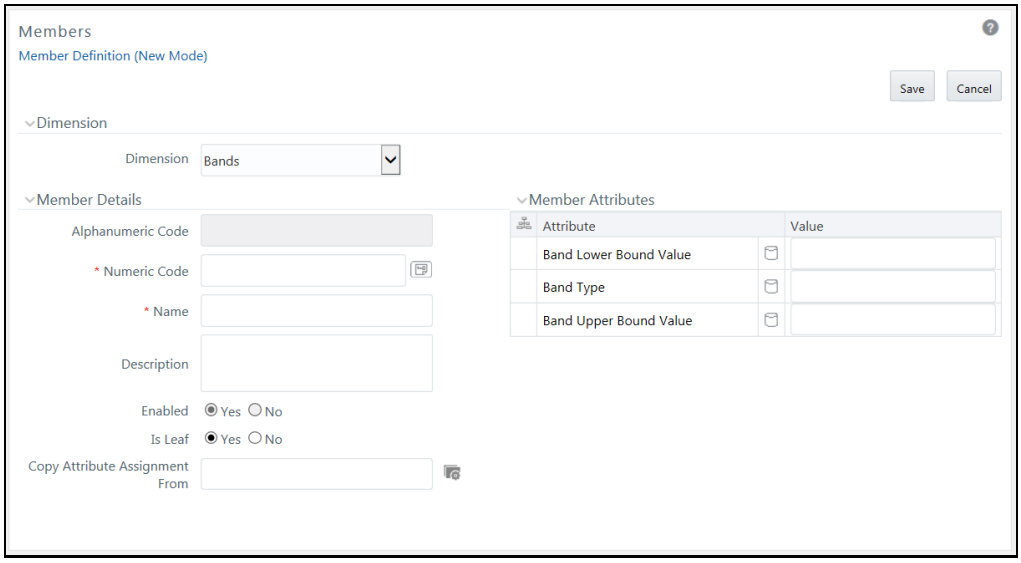
6.1 Adding Member Definition

This option allows you to add Member Definitions. The Write role should be mapped to your User Group.

To create an Attribute definition in the *Attributes* Window:

1. Click **Add** from the toolbar.
   The *Member Definition (New Mode)* Window is displayed.

Figure 38: Members Add Window



2. In the Dimensions Section, select the required **Dimension** from the drop-down list.
3. Enter the Member Details as tabulated:

The following table describes the fields in the Member Add Window.

Figure 39: Fields in the Members Add Window Field and their Descriptions

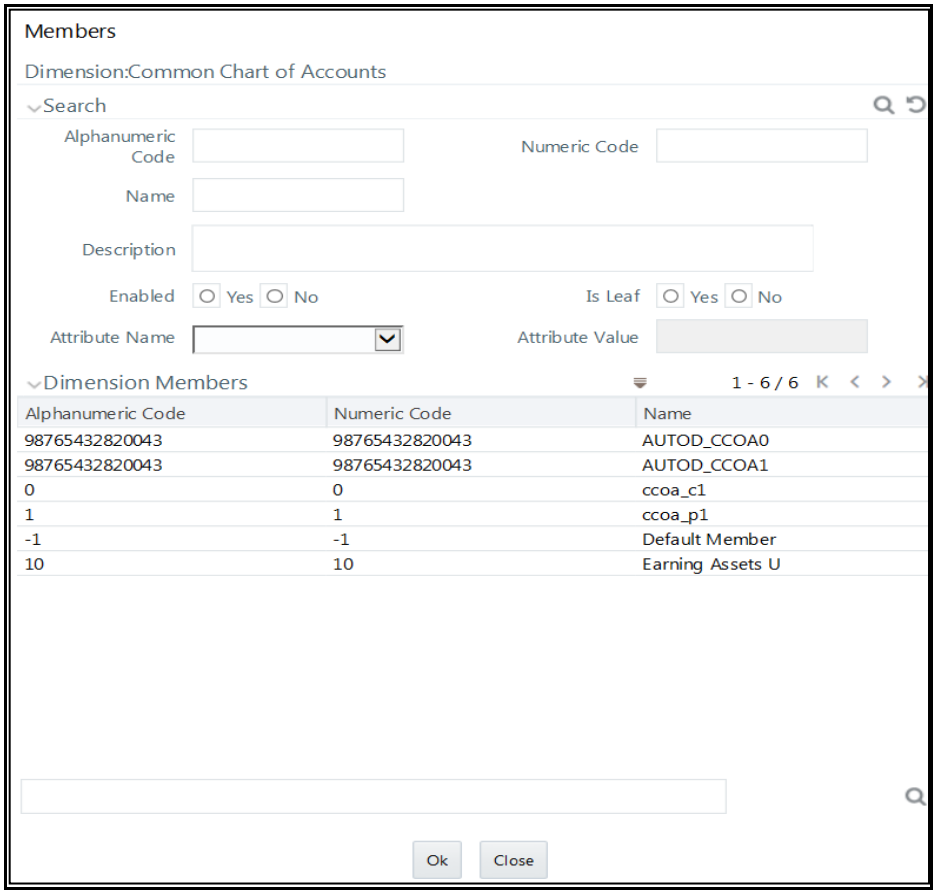
Field	Description
Fields marked in red asterisk (*) are mandatory.	
Alphanumeric Code	The **Alphanumeric Code** Field is editable only if the selected Dimension accepts Alphanumeric Code. For example, **Billing Method** Dimension. Else, the field is Read Only and the value is fetched from the **Numeric Code** field entered. Enter the required Alphanumeric Code. Ensure that the code has a maximum of 14 characters and there are no special characters like & ' ~ " @ + included.
Numeric Code	Enter the Numeric Code by doing any of the following: To auto-generate a Numeric Code, click the button. A system-generated code is displayed. Manually enter the required code which is auto validated for uniqueness. A maximum of 14 numeric characters can be specified. **Note**: if the selected Dimension accepts only Numeric Code, then the specified, Numeric Code is auto-populated to the **Alphanumeric Code** Field as well.
Name	Enter the **Name** of the Member. **Note**: The characters &' " are restricted
Description	Enter the required Description for the Member. **Note**: The characters ~&+' "@ are restricted.

Field	Description
Enabled	This field is set to **Yes** by default and is editable only in the *Edit* Window. **Note**: You can change the option to **No** only when the particular member is not used in any hierarchy. The disabled members will not be displayed in Hierarchy rules, or UIs which are based on Hierarchies, such as Hierarchy Filters and Hierarchical Assumption Browsers used in applications.
Is Leaf	This field is set to **Yes** by default. If **Yes**, the particular member can be used as a Leaf Node in any hierarchy and the Child cannot be added to this node. If **No**, the node becomes a non-leaf and can have child nodes. **Note**: A member created as Non-Leaf having Child Nodes to it in any hierarchy cannot be made Leaf.

NOTE If the Dimension is selected as "Common Chart of Accounts", proceed further. Otherwise, jump to step 5.

4. Click the  button in **Copy Attribute Assignment From** Field. The *Member Browser Properties* Window is displayed. This field can be left blank so that the Member Attributes Panel can be filled in without considering the values already assigned.

Figure 40:Member Browser Properties Window



- Select the required Member from the Dimension Members list.

  Click button in the Search grid to search for a specific Member based on Alphanumeric Code, Numeric Code, Name, Description, Enabled status, Is Leaf status, Attribute Name, or Attribute Value. You can also click button to find a member present in the Dimension Members grid using keywords.

- Click **OK**. The selected Member is displayed in the **Copy Attribute Assignment From** Field in the *New – Member Details* Window and the details of the selected Attribute are displayed in the Member Attributes Section. You can edit the Attribute details as indicated:

  Edit Attribute based on a date by clicking the (Calendar) icon.

  Edit Attribute based on a Dimension Value by selecting from the drop-down list.

  Edit Attribute based on a Number Value by entering the valid Numerical Value.

  Edit Attribute based on a String Value by specifying an Alphanumerical Value.

5. Click **Save** and the defined Member Definition is captured after validating the entries.

6.1.1 Viewing Member Definition

You can view individual Member Definition details at any given point. To view the existing Member Definition details in the *Members* Window:

1. Select the check box adjacent to the Alphanumeric Code of the Member, whose details are to be viewed.
2. Click **View** button in the toolbar.

   The *View – Member Details* Window is displayed with the details such as Dimension, Member Details, and Member Attributes Details.

6.1.2 Modifying Member Definition

To modify an existing Member Definition in the *Members* Window:

1. Select the check box adjacent to the Alphanumeric Code of the Member, whose details are to be updated.
2. Click **Edit** button in the toolbar. The **Edit** button is disabled if you have selected multiple Members. The *Edit – Member Details* Window is displayed.
3. Edit the Member details as required. For more information, see Add Member Definition.
4. Click **Save** to save the changes.

6.1.3 Copying Member Definition

The Copy Member Definition facilitates you to quickly create a new Member Definition based on the existing attributes or by updating the values of the required members.

To copy an existing Member Definition in the *Members* Window:

1. Select the check box adjacent to the Alphanumeric Code of the Member, whose details are to be duplicated.
2. Click the **Copy** button in the toolbar to copy a selected Member definition. **Copy** button is disabled if you have selected multiple Members.
3. In the *Copy – Member Details* Window you can:
   - Create a new Member with existing variables. Specify the **Numeric Code** and new **Member Name**.
   - Create a new Member Definition by updating the required variables. Specify the **Numeric Code** and new **Member Name**. Update the required details. For more information, see Add Member Definition. Click **Save**.

     The new member definition details are displayed in the *Members* Window.

6.1.4 Member Definition Dependencies

You can view the dependencies of Members. To view the dependency of members in the *Members* Window:

1. Select the check box adjacent to the Alphanumeric Code of the Member, whose dependency is to be viewed.

2. Click the **Check Dependencies** button in the toolbar. The **Check Dependencies** Button is disabled if you have selected multiple members. The *Members Dependency Information* Window is displayed with the dependency details.

6.1.5 Deleting Member Definition

You cannot delete predefined members or the members that are the Nodes for a hierarchy.

To delete a Member in the *Members* Window.

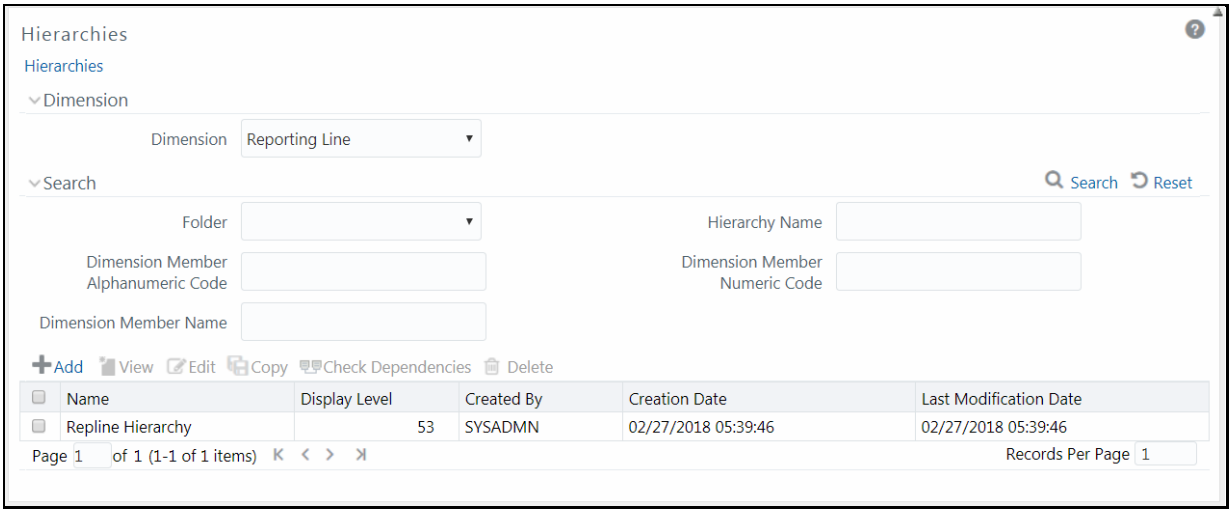
1. Select the check box adjacent to the Alphanumeric Code(s) of the Members, whose details are to be removed.
2. Click **Delete** button in the Dimension Members Toolbar.
3. Click **OK** in the information dialog to confirm the deletion.

7 OFSAA Hierarchies

Hierarchies refer to dimension members that are arranged in levels, with each level representing the aggregated total of the data from the level below. One dimension type can have multiple hierarchies associated with it. Hierarchies are available within the Dimension Management Section of the Infrastructure system.

You can access the *Hierarchies* Window by expanding **Unified Analytical Metadata** and **Dimension Management** within the tree structure of the LHS menu and selecting **Hierarchy Maintenance**.

Figure 41: Hierarchies Window



The *Hierarchies* Window displays the list of Hierarchies created in all public folders, shared folders to which you are mapped, and private folders for which you are the owner, along with other details such as the Name, Display level, Created By, Creation Date, and Last Modification Date. For more information on how object access is restricted, see the *Object Security in the AMHM Module* section in the OFS Analytical Applications Infrastructure User Guide.

You can also search for a specific Hierarchy Definition based on Folder, Hierarchy Name, Dimension Member Alphanumeric Code, Dimension Member Numeric Code, or Dimension Member Name and view the existing definitions within the system.

7.1 Adding Hierarchy Definition

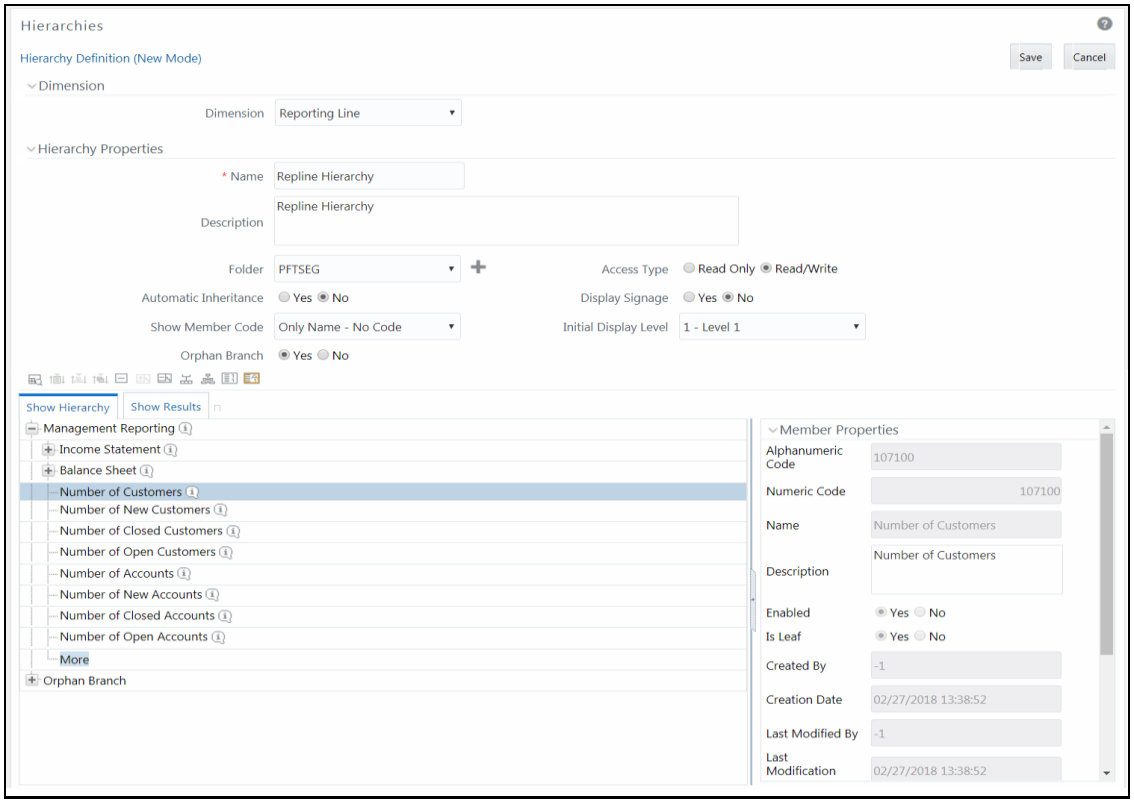
In the *Hierarchies* Window, you can create Hierarchy Definition up to 15 levels by default. The maximum permissible levels are up to 58 Hierarchies. To create a hierarchy, the Write role should be mapped to your User Group.

> **NOTE** When an AMHM hierarchy is created, implicitly a UAM Business Hierarchy also gets created and will be listed in the *Summary* Window of Business Hierarchy.

To create a Hierarchy definition in the *Hierarchies* Window:

1. Click ➕ **Add** button in the Hierarchies toolbar. The *New – Hierarchy Details* Window is displayed.

Figure 42: Hierarchies Window



2. Select **Dimension** from the drop-down list. The selected Dimension from the *New – Hierarchy Details* Window is displayed as the Default Dimension for which the member has to be defined.

The following table describes the fields in the Hierarchy Properties Window.

Figure 43: Fields in the Hierarchies Window and their Description

Field	Description
Fields marked in red asterisk (*) are mandatory.	
Name	Enter the **Name** of the Hierarchy. **Note**: The characters &' " are restricted.
Description	Enter the required **Description** for the Hierarchy. **Note**: The characters ~&+' " @ are restricted.

Field	Description
Folder	Select the folder where the hierarchy is to be stored from the drop-down list. The *Folder Selector* Window behavior is explained in the User Scope section see *Appendix A* in the OFS Analytical Applications Infrastructure User Guide. Click to create a new private folder. The *Segment Maintenance* Window is displayed. For more information, see the *Segment Maintenance* section in the OFS Analytical Applications Infrastructure User Guide. **Note**: You can select **Segment/Folder Type** as Private and the **Owner Code** as your user code only.
Access Type	Select the Access Type as **Read Only** or **Read/Write**. **Read-Only**: Select this option to give other users access to only view the Hierarchy Definition. **Note**: A user with a Phantom and Write role can modify or delete the hierarchy even though the access type is selected as Read-only. **Read/Write**: Select this option to give all users access to view, modify (including Access Type), and delete the Hierarchy Definition.
Automatic Inheritance	Click **Yes** to inherit the hierarchy properties of the parent to the child. Click **No** if you want to define a new hierarchy.
Display Signage	Click **Yes** to display the Signage to the right-hand side of the member in the Show hierarchy panel. Otherwise, click **No**.
Show Member Code	Select from the drop-down list as one of the following: **Alphanumeric Code to Left of Name**: Displays Alphanumeric Code on the Left side of Member Name. **Alphanumeric Code to Right of Name**: Displays Alphanumeric Code on the Right side of Member Name. **Only Name - No Code**: Displays only the Member Name. **Numeric Code to Left of Name**: Displays the Numeric Code on the Left side of Member Name. **Numeric Code to Right of Name**: Displays the Numeric Code on the Right Side of the Member Name.
Initial Display Level	Select the Initial Display level from the drop-down list.
Orphan Branch	Click **Yes** to display the Orphan Branch in the Show Hierarchy panel. Otherwise, click **No**.

3. To add Child under the **Show Hierarchy** tab:
   a. Right-click in the Show Hierarchy Tab.
   b. Select **Add Child** option and the *Add Member* Window is displayed.
   c. Select the required Member and click . The Member is displayed in the **Selected Members** Panel. Click to select all Members which are shown in the Show Members Pane. Click to select all Nodes/ Members in the server.

You can click < to deselect a Member or click « to deselect all the Members.

You can click to search for the required member using Alphanumeric Code, Numeric Code, Name, Description, Attribute Name, or Attribute Value.

You can also click button to toggle the display of Numeric Code left, right, or name and click button to display Alphanumeric Code left, right, or name.

d. Click **OK**.

The selected Member is displayed as Child under the **Show Hierarchy** panel in the *New – Hierarchy Details* Window.

4. To add Sibling:

a. Right-click on the Child and select the option **Add Sibling**. The *Add Member* Window is displayed.

b. Select the required Member and click >. The Member is displayed in the **Selected Members** panel. You can click » to select all Members which are shown in the Show Members Pane. Click to select all Nodes/ Members in the server.

c. You can click < to deselect a Member or click « to deselect all the Members. You can also Click to search for the required member.

d. Click **Apply**. The selected Member is displayed as **Sibling** below the **Parent** under the Show Hierarchy Panel in the *New – Hierarchy Details* Window.

5. To add Leaf under a Parent, Child, or Sibling:

a. Right-click the Parent or Child and select **Add Leaf**. The *Add Member* Window is displayed.

b. Select the required Member and click >. The Member is displayed in the **Selected Members** panel. You can click » to select all Members which are shown in the Show Members Pane. Click to select all Nodes/ Members in the server.

You can click < to deselect a Member or click « to deselect all the Members. You can also Click to search for the required member.

c. Click **Apply**. The selected Member is displayed as Leaf below the Parent or Sibling under the **Show Hierarchy** Panel in the *New – Hierarchy Details* Window.

6. To define Level Properties:

a. Select **Level Properties** from the options under Parent, Child, Sibling, or Leaf, and the *Level Properties* Window is displayed.

b. Enter the valid **Name** and **Description** in the respective fields.

c. Click **OK** and the Levels defined are displayed in the drop-down in the **Initial Level Display** Field in the **Hierarchy Properties** grid in the *New – Hierarchy Details* Window.

7. To cut and paste Child or Sibling:

a. Right-click on any node and select **Cut**.

b. Right-click on any node and **Paste as Child** or **Paste as Sibling**.

8. To **Delete** and Undelete:
   a. Right-click on the node to be deleted and select **Delete Node**.
   The node deleted is stroked out.
   b. Right-click and select **UnDelete** to cancel the deletion of the node.
9. To add Child / Sibling / Leaf:
   a. Right-click on any node and select **Create and add Child**. The *New - Member Details* Window is displayed.
   For more information, see Add Member Definition.
   b. Right-click on any node and select **Create and add Sibling**.
   c. Right-click on any node and select **Create and add leaf**.
10. To view the Member Properties and Member Attributes of a node in the Show Hierarchy Panel:
   a. Click the **<** button to display the Member Property Grid.
   b. Click on a Member. The properties such as Alphanumeric Code, Numeric Code, Name, Description, Enabled, Is Leaf, Created By, Creation Date, Last Modified By, Last Modification Date, Attribute, and Value of the selected Member are displayed in the Member Properties and Member Attributes Grids.
   In the *Hierarchies* Window you can also:
   — Click to collapse the members under a node.
   — Click or to expand a branch or collapse a branch.
   — Click or to focus or defocus a selected node except the Root Node.
   — Click or to view the name of members right or left.
   — Click or to view the Numeric Code values of members right or left.
   — Click or to show code or show the name of the members.
   — Click button to view the Advanced Properties of the nodes.
11. Click **Save** in the New – *Hierarchy Details* window to validate and capture the entries.
   The Audit Trail section at the bottom of the window displays the metadata about the Hierarchy with the option to add additional information as comments. The User Comments Section facilitates you to add or update additional information as comments.

7.1.1 Viewing Hierarchy Definition

You can view individual Hierarchy Definition details at any given point. To view the existing Hierarchy Definition details in the *Hierarchies* Window:

1. Select the check box adjacent to the Hierarchy Name.

2. Click **View** button in the Hierarchies toolbar. The **View** button is disabled if you have selected multiple Hierarchies.

   The *View – Hierarchy Details* Window is displayed with all the hierarchy details.

   In the *View – Hierarchy Details* Window you can click button to search for a member using the Alphanumeric Code, Numeric Code, or Member Name in the Search dialog.

> **NOTE** The search functionality of this button will not return any values if you search for a node in the Orphan Branch of the hierarchy.

7.1.2 Modifying Hierarchy Definition

You can modify the Name, Description, Folder, Access Type, Automatic inheritance, Display Signage, Show Member Code, Initial Display level, Orphan branch, Show hierarchy details in *Edit – Hierarchy Details* Window.

> **NOTE** When you modify a Hierarchy, the implicitly created UAM Business Hierarchy will also get updated.

1. Select the check box adjacent to the Hierarchy Name whose details are to be updated.
2. Click **Edit** button in the Hierarchies toolbar. The **Edit** button is disabled if you have selected multiple Members. The *Edit – Hierarchy Details* Window is displayed.

   In the *Edit – Hierarchy Details* Window you can click button to search for a member using the Alphanumeric Code, Numeric Code, or Member Name in the Search dialog. Edit the Hierarchy Details as required. For more information, see Add Hierarchy Definition.
3. Click **Save** and save the changes.

7.1.3 Copying Hierarchy Definition

The Copy Hierarchy Definition facilitates you to quickly create a new Hierarchy Definition based on the existing attributes or by updating the values of the required hierarchies.

To copy an existing Hierarchy Definition in the *Hierarchies* Window:

1. Select the check box adjacent to the Hierarchy Name whose details are to be duplicated.
2. Click the **Copy** button in the Hierarchies toolbar to copy a selected Hierarchy Definition. **Copy** button is disabled if you have selected multiple Hierarchies. The *Copy – Hierarchy Details* Window is displayed.

   In the *Copy – Hierarchy Details* Window you can click button to search for a member using the Alphanumeric Code, Numeric Code, or Member Name in the Search dialog.
3. In the *Copy – Hierarchy Details* Window you can:

- Create a new Hierarchy Definition with existing variables. Specify a new **Hierarchy Name**. Click **Save**.
- Create a new Hierarchy Definition by updating the required variables. Specify a new Hierarchy Name and update the required details. For more information, see Add Hierarchy Definition. Click **Save**.

The new Hierarchy Definition details are displayed in the *Hierarchy* Window.

7.1.4 Hierarchy Definition Dependencies

You can view the dependencies of Hierarchies. To view the dependency of hierarchy in the *Hierarchies* Window:

1. Select the check box adjacent to the Hierarchy Name.
2. Click the  button in the Hierarchies toolbar.
   The **Check Dependencies** button is disabled if you have selected Hierarchy Definitions. The *Hierarchies Dependency Information* Window is displayed.

7.1.5 Deleting Hierarchy Definition

You can remove the Hierarchy Definitions which are not required in the system by deleting them from the *Hierarchy* Window.

> **NOTE** When you delete an AMHM Hierarchy, the implicitly created UAM Business Hierarchy will also get deleted, if it is not used in higher objects.

1. Select the check box adjacent to Hierarchy Name(s) whose details are to be removed.
2. Click the **Delete** button in the Hierarchies toolbar.
3. Click **OK** in the information dialog to confirm the deletion.

To delete an existing Business Hierarchy in the *Business Hierarchy* Window:

1. Select the check box adjacent to the required Business Hierarchy Code.
2. Click the  button from the Business Hierarchy toolbar.
   A confirmation dialog is displayed.
3. Click **OK**. The Business Hierarchy details are marked for delete authorization.

8 OFSAA Filters

Filters in the Infrastructure system allow you to filter metadata using the defined expressions.

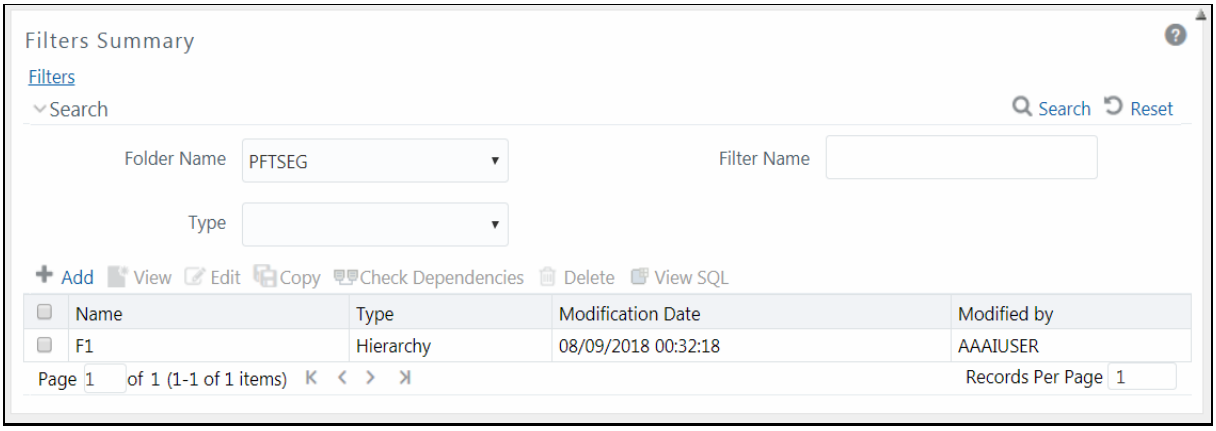
8.1 Navigating to Filters

You can access Filters by expanding the **United Analytical Metadata** section within the tree structure of the LHS Menu and selecting **Filter**.

Based on the role that you are mapped to, you can access read, modify or authorize the *Filters* Window. For all the roles and descriptions, see *Appendix A* in the OFS Analytical Applications Infrastructure User Guide. The roles mapped to Filters are as follows:

- Filter Access
- Filter Advanced
- Filter Authorize
- Filter Phantom
- Filter Read Only
- Filter Write

Figure 44: Filter Summary Window



The *Filters Summary* Window displays the list of Filters created in all public folders, shared folders to which you are mapped, and private folders for which you are the owner, along with the other details such as the Name, Type, Modification Date, and Modified By. For more information on how object access is restricted, see the *Object Security in Dimension Management* Section in the OFS Analytical Applications Infrastructure User Guide.

You can also search for a specific Filter definition based on Folder Name, Filter Name, or Type and view the list of existing definitions within the system. If you have selected Hierarchy from the Type drop-down list, the Dimension drop-down list is also displayed.

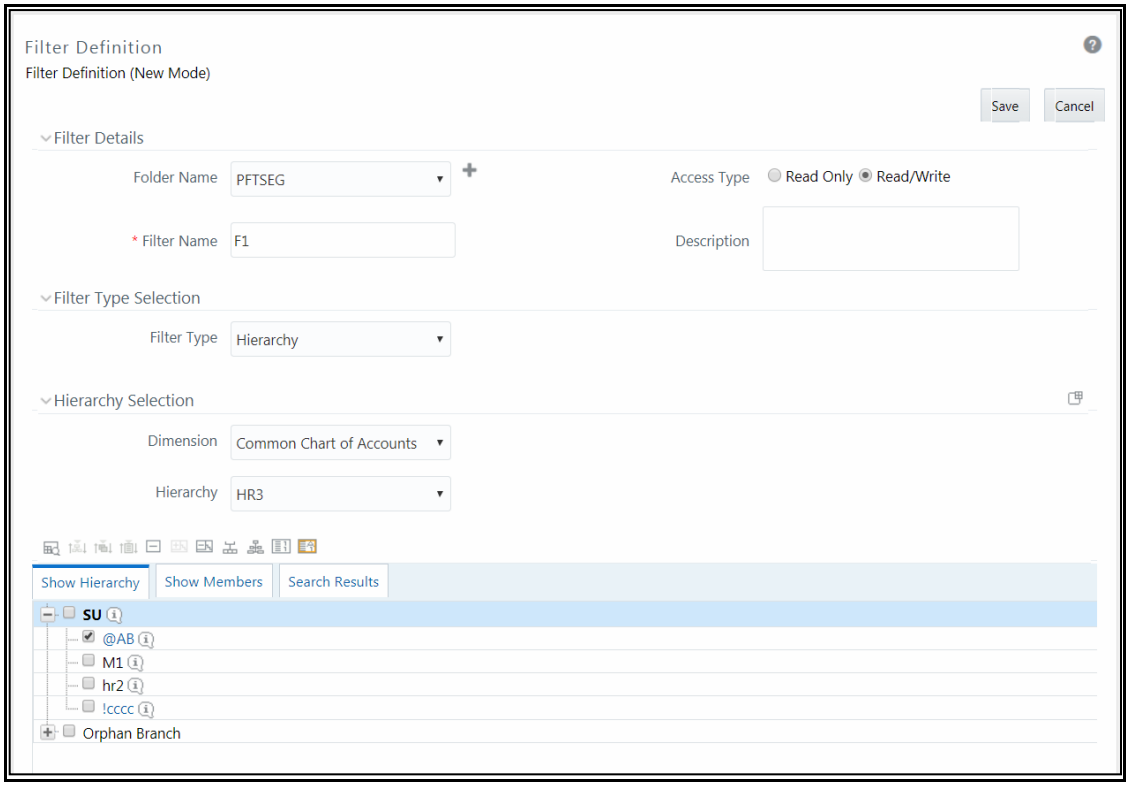
8.2 Adding Filter Definition

This option allows you to add a filter. A Filter can be of four types namely, Data Element, Hierarchy, Group, and Attribute. To create a filter definition, the Write role should be mapped to your User Group.

To create a new filter from the *Filters Summary* Window:

1. Click **Add** button in the Filters toolbar.
   The *Filter Definition* Window is displayed.

Figure 45: Filter Definition New Window



2. Enter the Filter Details section details as tabulated:

The following table describes the fields in the Filter Definition Window.

Figure 46: Fields in the Filter Definition window and their Description

Field	Description
Filter Details	
Folder Name	Select the Folder Name where the Filter is to be stored from the drop-down list. The *Folder Selector* Window behavior is explained in the *User Scope* section in the OFS Analytical Applications Infrastructure User Guide. Click to create a new private folder. The *Segment Maintenance* window is displayed. For more information, see the *Segment Maintenance* section in the OFS Analytical Applications Infrastructure User Guide. **Note**: You can select **Segment/Folder Type** as Private and the **Owner Code** as your user code only.

Access Type	Select the Access Type as **Read Only** or **Read/Write.** **Read-Only**: Select this option to give other users access to only view the filter definition. **Note**: A user with a Phantom and Write role can modify or delete the filter even though the access type is selected as Read-only. **Read/Write**: Select this option to give all users access to view, modify (including Access Type) and delete the filter definition.
Filter Name	Enter the filter name in the **Filter Name** field. **Note**: The characters &' " are restricted.
Description	Enter the description of the filter in the **Description** field. **Note**: The characters ~&+' " @ are restricted.

3. From the Filter Type Selection pane, select the **Filter Type** from the drop-down list.

   There are four different Filter Types available in the Filter Type Selection grid as tabulated. Click the links to navigate to the appropriate sections.

The following table describes the fields in the Filter Type pane.

Figure 47: Fields in the Filter Type pane and their Description

Filter	Description
Data Element	**Data Element Filter** 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. **Example**: Balances between 10,000 and 20,000 Accounts opened in the current month Loans with Amortization terms greater than 20 years. Data Element Filters can access most instrument columns and most columns in the Management Ledger. Data Element Filters are used within other OFSAA rule types. (For example, Allocation rules, Transfer Pricing rules, Asset | Liability Management rules, and so on).
Hierarchy	**Hierarchy Filter** allows you to utilize rollup nodes within a Hierarchy to help you exclude (filter out) or include data within an OFSAA Rule. **Example**: You might want to process data for a specific set of divisions or lines of business where you have a Hierarchy rule that expresses those divisions or lines of business as rollup nodes. A Hierarchy Filter could be constructed to "enable" the Commercial and Retail lines of business while NOT enabling the Wealth Management line of business. Each of these lines of business might include a handful or even thousands of cost centers. When incorporated into an OFSAA Processing Rule, this Hierarchy Filter would include every cost center in the Commercial and Retail lines of business.

Filter	Description
Group	**Group Filters** can be used to combine multiple Data Element Filters with a logical "AND". **Example**: If Data Element Filter #1 filtered on mortgage balances greater than 100,000 and Data Element Filter #2 filtered on current mortgage interest rates greater than 6%, you could construct a Group Filter to utilize both Data Filters. In this case, the resulting Group Filter would constrain your data selection to mortgage balances greater than 100,000 AND current mortgage interest.
Attribute	**Attribute Filters** are created using defined Attributes. Attribute filters facilitate you to filter on one or more Dimension Type Attributes. For each attribute, you can select one or more values. **Example**: Consider a filter that selects all records where the dimension Common Chart of Account member represents an attribute value Expense account, that is, the attribute **"Account Type" = Expense**. Now, using Attribute Filters, you can specify complex criteria as given below: Common Chart of Accounts where the Account Type attribute is Earning Assets or Interest-bearing Liabilities, and the Accrual Basis attribute is Actual/Actual Also, You could further refine the filter by adding another condition for: Organizational Unit where the Offset Org ID is a specific Org member The Filter then saves these criteria rather than the member codes which meet the criteria at the time the Filter is saved. During execution, the engine dynamically selects all records from your processing table (example. Mortgages, Ledger, and so on.), which meet the specified member attribute criteria.

Once the required filter conditions are defined, save the Filter definition.

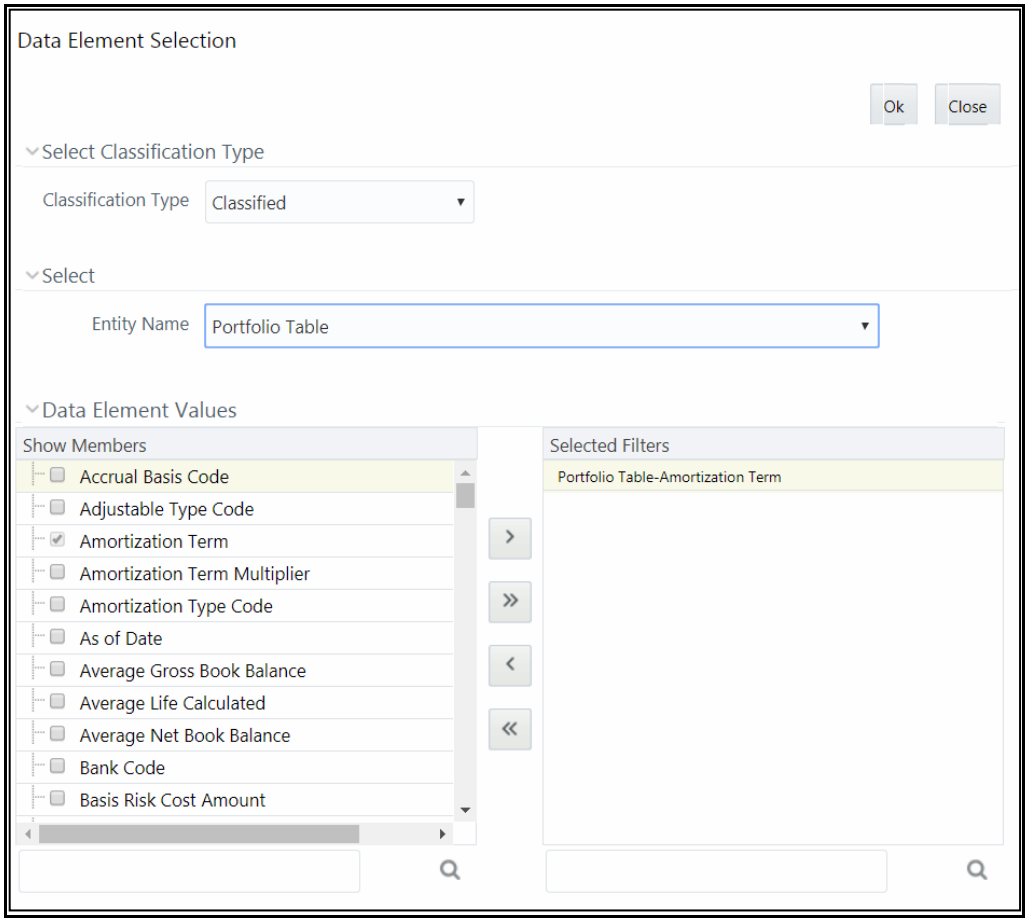
8.2.1 Define Data Element Filter

When you have selected the Filter Type as Data Element, define the Filter conditions by doing the following in the Data Element Selection Section:

1. In the Data Element Selection Section, click the  button.

   The Data Element Selection Window is displayed.

Figure 48: Data Element Selection Window



- Select any of the following Filter **Classification Type** from the drop-down list:
  - **Classified** - This is the default selection and displays all the classified EPM specific entities. If you are an EPM user, you need to select this option while defining Data Element Filter to list all the related entities.
  - **Unclassified** - This option displays all the non-classified, that is non EPM specific entities. If you are a non EPM user, you need to select this option while defining Data Element Filter to list all the related entities.
  - **All** - This option will select all the tables available in the selected Information Domain irrespective of whether an entity has its table is classified or not.
- Select the required database table from the **Entity Name** drop-down list. The associated members are displayed in the Show Members Section.
- Select the required member and click ›. The member is listed in the Selected Members panel. Click » to move all Members.

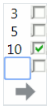
  You can click ‹ to deselect a Member or click « to deselect all Members.
- Click **OK**. The selected Data Elements are displayed in the **Data Element Selection** Field.

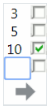
2. Select the **Filter Method** from the drop-down list.

For each column you wish to include in your Data Filter definition, you must specify one of the following Filter Methods:

The following table describes the fields in the Data Filter Definition.

Figure 49: Fields in the Data Filter Definition Window and their Description

Filter	Description
Specific Values	**Specific Values** are used to match a selected database column to a specific value or values that you provide. You may either include or exclude Specific Values. You can add additional values by clicking the **Add** button. Click adjacent to **Add** button to add 3, 5, 10 rows by selecting the check box adjacent to 3, 5, or 10 respectively. You can add a custom number of rows by specifying the number in the text box provided, as shown, and click .  To remove a row, select the check box and click **Delete**. When comparing Specific Values for a character type column, you must provide Specific Values that are character strings. When comparing Specific Values for a date type column, you must provide Specific Values that are dates (the application displays a Calendar control). When comparing Specific Values for a numeric column, you must provide Specific Values that are numbers. Select **Include Values** or **Exclude Values** to include or exclude the selected values.

Filter	Description
Ranges	**Ranges** are used to match a selected database column to a range of values or to the ranges of values that you provide. You may either include or exclude Range values. Range Type is available for OFSA Datatype Term, Frequency, Leaf, Code, and Identity and Column Datatype Date, Numeric, and Varchar. You can add additional values by clicking the **Add** button. Click adjacent to **Add** button to add 3, 5, 10 rows by selecting the check box adjacent to 3, 5, or 10 respectively. You can add a custom number of rows by specifying the number in the text box provided, as shown, and click .  To remove a row, select the check box and click **Delete**. If the Column Datatype is VARCHAR, provide Specific Values (Alphanumeric) that are character strings. If the Column Datatype is DATE, provide Specific Values that are dates (the application displays a Calendar Control). If the Column Datatype is Numeric, provide Specific Values that are numbers. If OFSA Datatype is LEAF, provide either Numeric Values or click to select the Numeric Member IDs. If OFSA Datatype is CODE, provide either Numeric Values or click to select the Numeric Member IDs. If OFSA Datatype is IDENTITY, provide specific Numeric Values. However, no validation is done during save to validate the input value for a valid Identity Code. Select **Include Values** or **Exclude Values** to include or exclude the selected values.
Another Data Element	**Another Data Element** is used to match a selected database column to another database column. When constructing an Another Data Element Filter Method, you may only compare a column to other columns that you have already selected (the Data Element drop-down list box will only contain columns that you have already selected). You may use any of the following operators when choosing the Another Data Element Filter Method: =, <> (meaning "not equal to"), <, >, <=, or >=.
Expression	**Expression** is used to match a selected database column to the results of an OFSAAI Expression Rule. You may any of the following operators when choosing the Expression Filter Method: =, <> (meaning "not equal to"), <, >, <=, or >=.

- Click **Add** to list the completed filter conditions in the Filter Conditions Grid.
- Click **Update** after modifying a filter condition to update in the Filter Conditions Grid.
- Click ▲ or ▼ buttons to move a selected Filter Condition up or down.
- Click the button to delete selected individual Filter Conditions Records.

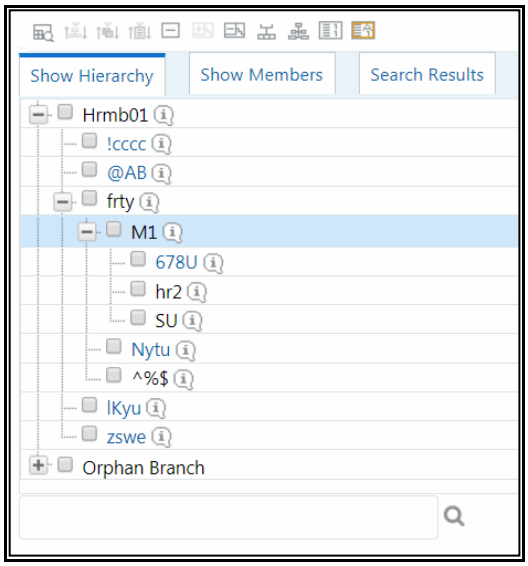
3. Click **Add** or **Edit** in the *Filter Definition* Window if you are creating a new or updating an existing Filter Definition.
4. Click **Save** to validate the entries and save the filter details.

8.2.2 Define Hierarchy Filter

When you have selected the Filter Type as Hierarchy, define the Filter conditions by doing the following in the Hierarchy Selection Section:

1. Select the required **Dimension** from the drop-down list.
2. Select the associated **Hierarchy** from the drop-down list. You can select **More** to search for a specific Hierarchy in the Hierarchy more dialog.
3. Select any combination of rollup points and leaf (Last Descendent Child) values.

Figure 50: Show Hierarchy Tab



The Show Hierarchy tab displays the leaves in each node in ascending order of Members.

To sort the nodes alphabetically, HIERARCHY_IN_FILTER_SORT-$INFODOM$-$DIMENSION_ID$=$VALUE$ in the AMHMConfig.properties file present in the deployed location should be set as Y. You should add such entry for all the required Dimension IDs for the sort functionality to work for those dimensions.

For example:
HIERARCHY_IN_FILTER_SORT-OFSAAINFO-4345=Y

Restart servers after making any change in AMHMConfig.properties file for the change to take effect.

From this pane, you can:

- Click button to search for a Hierarchy Member using Dimension Member Alphanumeric Code, Dimension Member Numeric Code, Dimension Member Name, or Attribute and by keying in Matching Values in the Search dialog. The search results are also displayed in the ascending order of Member Names.

- Click to collapse the members under a Node.
- Click or to expand a Branch or collapse a Branch.
- Click or to view the Name of members right or left.
- Click or to view the Numeric Code values of members right or left.
- Click or to show Code or show the Name of the members.
- Click or to focus or defocus a Selected Node except the Root Node.

  You can also click the button to find a member present in the nodes list using keywords. For a large tree (nodes>5000), this search will not return any value if the tree is not expanded.

4. Click **Save** to validate the entries and save the filter details.

8.2.3 Define Group Filter

When you have selected the Filter Type as Group, define the Filter conditions by doing the following in the Data Element Filters Grid:

1. Select the check box(s) adjacent to the required member names in the Available Filters Section and click . The selected members are displayed in the Selected Filters Section. Click to select all the Members.

   You can click to deselect a Member or click to deselect all the Members.

   You can also click button to search for a member in the Data Element Filter Search dialog using **Folder Name** and **Filter Name**.
2. Click **Save** to validate the entries and save the filter details.

8.2.4 Define Attribute Filter

When you have selected the Filter Type as Attribute, define the Filter conditions by doing the following in the Attribute Selection Section:

1. Select the required **Dimension** from the drop-down list.
2. Select the associated **Attribute** from the drop-down list. The list consists of only Dimension Type attributes for selection.
3. Click the button in the Attribute Values Grid. The *Attribute Values* Window is displayed.

   In the *Attribute Values* window, the **Dimension** field under the Dimension Grid is auto-populated with the Dimension name with which the selected Attribute is defined and is non-editable. In the Search Grid, you can search for Attribute Values depending on Alphanumeric Code, Numeric Code, or Name.
4. Select the check box(s) adjacent to the Alphanumeric Codes of the required Attribute Values in the Attribute Values Grid and click **OK**. The Attribute Values grid displays the selected Attribute Values.

Select Attribute Value(s) in the Attribute Values grid and click the button to delete it.

You can use the Attribute Values present in the Attribute Values grid to generate conditions.

5. Click **Add** button in the Attribute Values Grid. The Filter Conditions Grid is populated with the filter condition using all the Attribute Values.

   You cannot define two conditions using the same attributes, since conditions are joined with a logical 'AND' and this will make the query invalid.

   In the Filter Conditions Grid, you can select a condition to view the Attribute Values used to generate it and can update the condition.

   You can also click button to view the SQL Statement in the *View SQL* Window. Click the button to view a long filter condition in the View Condition dialog.

6. Click **Save**. The Attribute Filter definition is saved.

8.3 Viewing Filter Definition

You can view individual Filter details at any given point.

To view the existing Filter Definition details in the *Filters Summary* Window:

1. Select the check box adjacent to the Filter Name.
2. Click **View** button in the Filter toolbar.

   The *View – Filter Details* Window is displayed with the filter details.

8.4 Modifying Filter Definition

This option allows you to modify the details of Filters.

1. Select the check box adjacent to the Filter Name whose details are to be updated.
2. Click **Edit** button and the *Edit – Filter Details* Window is displayed. Modify the required changes.
   For more information, see Add Filter Definition.
3. Click **Save** to save the changes.

8.5 Copying Filter Definition

The Copy Filter Definition facilitates you to quickly create a new Filter Definition based on the existing parameters or by updating the values.

To copy an existing Filter Definition in the *Filters* Window:

1. Select the check box adjacent to the Filter Name which you want to create a copy.
2. Click **Copy** button in the Filters toolbar. **Copy** button is disabled if you have selected multiple check boxes. The *Copy – Filter Details* Window is displayed.
3. In the *Copy – Filter Details* window you can:

- Create a new filter definition with existing variables. Specify a new **Filter Name** and click **Save**.
- Create a new filter definition by updating the required variables. Specify a new Filter Name and update the required details.
  For more information, see Add Filter Definition. Click **Save.**

The new filter definition details are displayed in the *Filters Summary* Window.

8.6 Checking Dependencies

You can view the dependencies of a defined Filter. You can use a filter in a Run Definition. However, the Run Definitions are not shown as dependent objects when you check dependency for a filter. This is a limitation.

To check the dependencies of a filter from the *Filters Summary* Window:

1. Select the check box adjacent to the Filter Name.
2. Click the button in the Filters toolbar. The **Check Dependencies** button is disabled if you have selected multiple members.

   The *Dependent Objects* Window is displayed with Object ID, Name, and ID Type of the Dependent Objects.

8.7 Viewing SQL of Filter

You can view the corresponding SQL of a defined filter.

To view the SQL of a filter from the *Filters Summary* Window:

1. Select the check box adjacent to the filter to view the SQL.
2. Click View SQL button. The SQL equivalent of the selected filter is displayed in the View SQL Window.

8.8 Deleting Filter Definition

You can remove the Filter Definitions which are not required in the system by deleting them from the *Filters Summary* Window.

> **NOTE** A Filter Definition with dependency cannot be deleted. However, if the dependent object is a Run Definition, you can delete the filter definition. This is a limitation.

1. Select the check box adjacent to the Filter Name whose details are to be removed.
2. Click **Delete** in the Filters toolbar.
3. Click **OK** in the information dialog to confirm the deletion.

9 OFSAA Expressions

An Expression is a user-defined tool that supplements other IDs and enables to manipulate data flexibly. Expression has three different uses as follows:

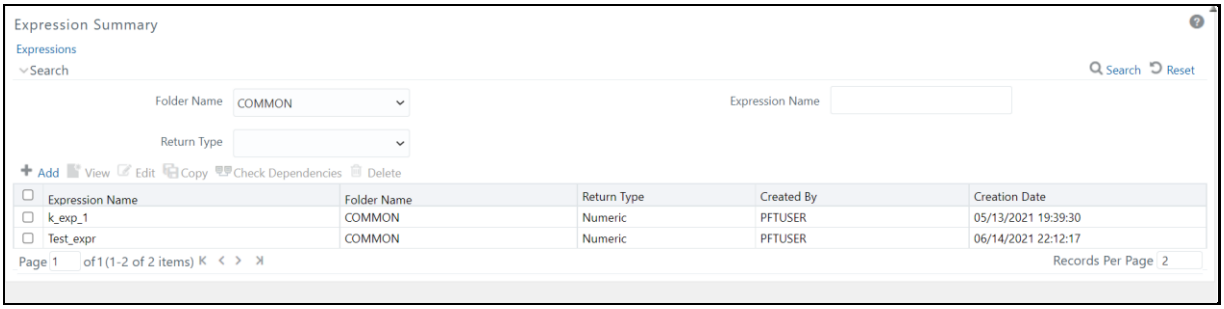
- To specify a calculated column that the Oracle Financial Services Analytical Application derivatives from other columns in the database.
- To calculate assignments in data correction.
- To create calculated conditions in data and relationship filters.

Example: Calculations like Average Daily Balances, Current Net Book Balance, Average Current Net Book Balance, and Weighted Average Current Net Rate can be created through Expressions.

Based on the role that you are mapped to, you can access read, modify or authorize *Expression* Window. For all the roles and descriptions, see *Appendix A* in the OFS Analytical Applications Infrastructure User Guide. The roles mapped to Expression are as follows:

- Expression Access
- Expression Advanced
- Expression Authorize
- Expression Phantom
- Expression Read Only
- Expression Write

Figure 51: Expression Summary Window



The *Expression Summary* Window displays the list of pre-defined Expressions with other details such as the Expression Name, Folder Name, Return Type, Created By, and Creation Date. For more information on how object access is restricted, see the *Object Security in Dimension Management Module* Section in the OFS Analytical Applications Infrastructure User Guide.

You can also search for a specific Expression definition based on Folder Name, Expression Name, or Return Type and view the list of existing definitions within the system.

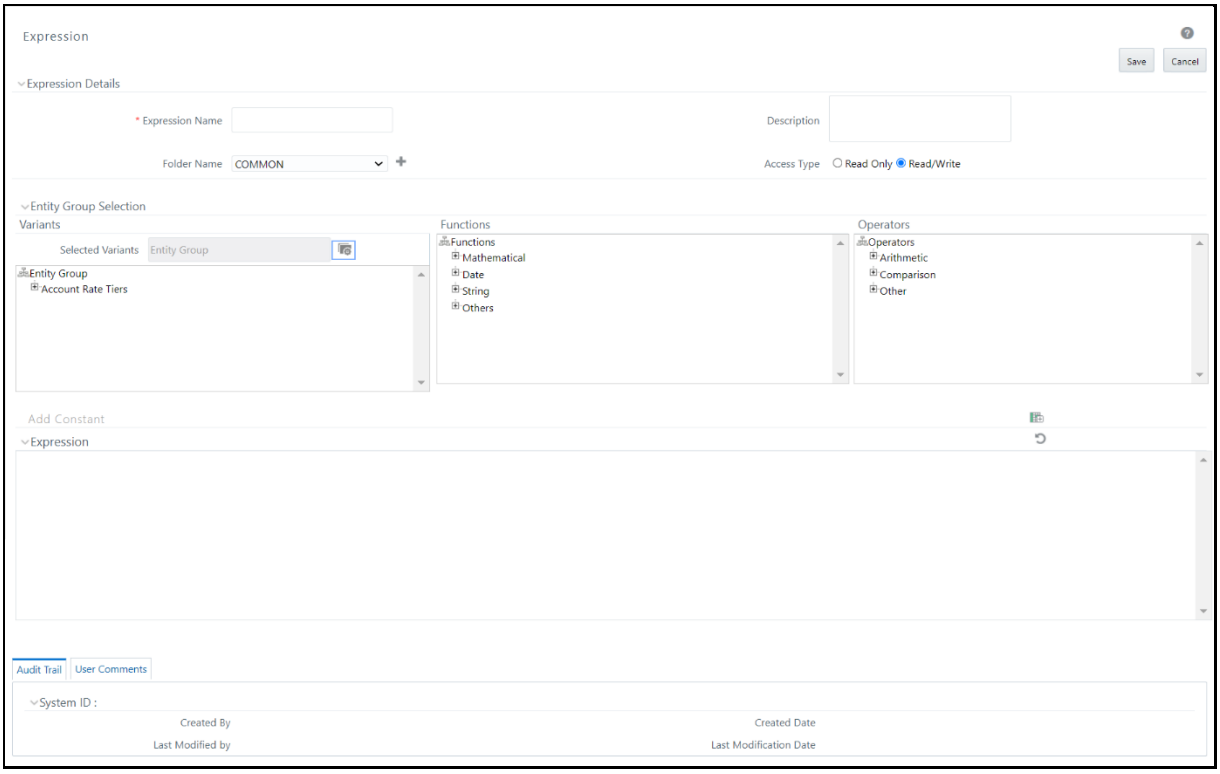
9.1 Adding Expression Definition

This option allows you to add an expression definition using Variables, Functions, and Operators. The Write role should be mapped to your User Group.

To create a new Expression from the *Expressions Summary* Window:

1. Click ➕ **Add** button in the Expressions Toolbar. The *New - Expression* Window is displayed.

Figure 52: Expression Summary New Window



2. In the Expression Details Grid:

   - Enter the **Expression Name** and the required **Description**.

> **NOTE** Expression Name: The characters &' " are restricted in the Name Field. Description: The characters ~&+' "@ are restricted in the description field.

   - Select the **Folder Name** from the drop-down list.
     - The *Folder Selector* Window behavior is explained in the *User Scope* section in the OFS Analytical Applications Infrastructure User Guide.
     - Click ➕ to create a new private folder. The *Segment Maintenance* Window is displayed. For more information, see the *Segment Maintenance* section in the OFS Analytical Applications Infrastructure User Guide.

> **NOTE** You can select **Segment/Folder Type** as Private and the **Owner Code** as your user code only.

   - Select the **Access Type** as Read Only or Read/Write.

- **Read-Only**: Select this option to give other users the access to only view the expression.

> **NOTE** A user with a Phantom and Write role can modify or delete the expression even though the access type is selected as Read-only.

- **Read/Write**: Select this option to give all users access to view, modify (including Access Type) and delete the expression.

3. In the Entity Group Selection Grid:
   - In the Variants section, click the button The *Variant Selection* Window is displayed.
     - Select the **Entity Type** and **Entity Name** from the drop-down lists.
     - Select the required member and click . The member is displayed Selected Members list. Click to select all the Members.

     You can also click to deselect a Member or click to deselect all Members.
     - Click **OK**. The selected Entity Name and Members are displayed in the Variants Section in the *New Expression* Window.
   - In the Variant's section, click "**+**" to expand Entity Group and double-click to select the required Entity. The selected Entity is displayed in the Expression Grid.
   - In the Function section, click "**+**" to expand Functions and select a function such as Mathematical, Date, String, or Others options. The selected Function is displayed in the Expression grid. For more information see the *Function Types and Functions* Section in the OFS Analytical Applications Infrastructure User Guide.
   - In the Operators section, click "**+**" to expand Operators and select an operator such as Arithmetic, Comparison, or Others. The selected Operator is displayed in the Expression grid. For more information see the *Operator Types* Section in the OFS Analytical Applications Infrastructure User Guide.
     - You can click the button from the Add Constant grid to specify a Constant Value. Enter the Numerical Value and click .
   - In the Expression grid, you can right-click on the expression and do the following:
     - Click **Replace Expression** ( ) to replace the expression with a new one.
     - Click **Insert Expression After** ( ) to insert a new expression after the selected Expression.
     - Click **Delete** ( ) to delete a selected Expression.
     - You can also click button in the Expression Grid to clear the Expression.
4. Click **Save** to validate the entries and save the new Expression.

9.2 Viewing Expression

You can view individual Expression details at any given point. To view the existing Expression details the *Expression Summary* Window:

1. Select the check box adjacent to the Expression Name.
2. Click  **View** button in the Expressions toolbar.

The *View Expression* Window is displayed with the Expression details.

9.3 Modifying Expression

You can modify the Expression details as required in the Edit – Expression Screen.

1. Select the check box adjacent to the Expression Name whose details are to be updated.
2. Click  **Edit** button and the Edit – Expression Window is displayed. Modify the required changes. For more information, see Add Expression Definition.
3. Click **Save** and upload the changes.

9.4 Copying Expression

The Copy Expression facilitates you to quickly create a new Expression based on the existing parameters or by updating the values. To copy an existing Expression in the *Expression Summary* Window:

1. Select the check box adjacent to the Expression Name which you want to create a copy.
2. Click  **Copy** button in the Expressions toolbar. **Copy** button is disabled if you have selected multiple check boxes. The *Copy – Expression* Window is displayed.
3. In the *Copy – Expression* Window you can:
   - Create a new Expression with existing variables. Specify a new **Filter Name** and click **Save**.
   - Create a new Expression by updating the required variables. Specify a new Expression Name and update the required details. For more information, see Add Expression Definition. Click **Save.**

The new Expression details are displayed in the *Expression Summary* Window.

9.5 Checking Dependencies

You can view the dependencies of a defined Expression in the Expression Summary Screen:

1. Select the check box adjacent to the required Expression Name.
2. Click the  button in the Expressions toolbar. The **Check Dependencies** Button is disabled if you have selected multiple expressions.

The *Dependent Objects* Window is displayed with Object ID, Name, and id type of the Dependent Objects.

9.6 Deleting Expression

You can delete an expression that has a Read/Write Access Type. To delete an expression from the *Expression Summary* Window:

1. Select the check box adjacent to the Expression Name(s) whose details are to be removed.
2. Click  **Delete** in the Expressions toolbar.
3. Click **OK** in the information dialog to confirm the deletion.

10 OFSAA Rate Management

OFSAA Rate Management is a comprehensive utility enabling you to manage currencies, yield curves, interest rates, and currency exchange rate data with a high degree of security and. OFSAA Rate Management also allows you to maintain economic forecasts such as GDP growth, inflation rates, or unemployment projections that can be linked to your models for interest rates, exchange rates, or new business growth.

Historical rate data obtained from OFSAA Rate Management is utilized by the Enterprise Performance Management (EPM) applications (OFS Funds Transfer Pricing, OFS Profitability Management, OFS Asset Liability Management, and OFS Balance Sheet Planning).

- Interest Rates
- Currency
- Currency Rates
- Economic Indicators

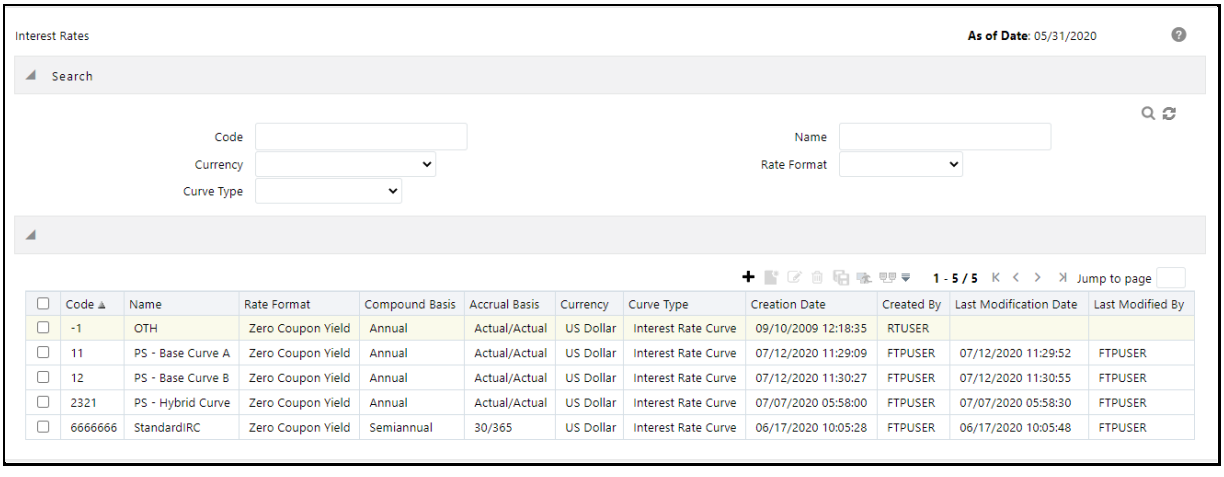
10.1 Interest Rates

The quality and availability of interest rate information vary throughout the world. In many markets, gathering comprehensive rate information is a challenge because of insufficient security types, inconsistent quoting conventions, and lack of liquidity. The Interest Rates module in OFSAA Rate Management allows you to define and manage complex yield curve definitions using multiple rate formats and other rate attributes to give you data storage capabilities appropriate to your market. The Interest Rates module also supports the creation and maintenance of historical rate data for each yield curve you define.

Historical interest rate data from OFSAA Rate Management is utilized in OFSAA Transfer Pricing to generate transfer rates and option costs. Historical interest rate data is also utilized in OFSAA Asset Liability Management and OFSAA Balance Sheet Planning to generate forecasted interest rate scenarios.

To view the Interest Rate Code Summary page, navigate to **Common Object Maintenance** and select **Rate Management**, and then select **Interest Rates**.

Figure 53: Interest Rate Summary Page



Code	Name	Rate Format	Compound Basis	Accrual Basis	Currency	Curve Type	Creation Date	Created By	Last Modification Date	Last Modified By
-1	OTH	Zero Coupon Yield	Annual	Actual/Actual	US Dollar	Interest Rate Curve	09/10/2009 12:18:35	RTUSER		
11	PS - Base Curve A	Zero Coupon Yield	Annual	Actual/Actual	US Dollar	Interest Rate Curve	07/12/2020 11:29:09	FTPUSER	07/12/2020 11:29:52	FTPUSER
12	PS - Base Curve B	Zero Coupon Yield	Annual	Actual/Actual	US Dollar	Interest Rate Curve	07/12/2020 11:30:27	FTPUSER	07/12/2020 11:30:55	FTPUSER
2321	PS - Hybrid Curve	Zero Coupon Yield	Annual	Actual/Actual	US Dollar	Interest Rate Curve	07/07/2020 05:58:00	FTPUSER	07/07/2020 05:58:30	FTPUSER
6666666	StandardIRC	Zero Coupon Yield	Semiannual	30/365	US Dollar	Interest Rate Curve	06/17/2020 10:05:28	FTPUSER	06/17/2020 10:05:48	FTPUSER

10.1.1 Searching for Interest Rate Curve

A Search pane is provided to search for interest rate curves using Code, Name, Currency, Rate Format, or Curve Type parameters.

To search the Interest Rate, follow these steps:

1. Enter the search criteria and click **Search**.
2. Click **Reset** to remove any **Code**, **Name**, **Currency**, **Rate Format**, or **Curve Type** constraint specified and refresh the window.

   The search results are displayed in a table containing all of the interest rate curves that meet the search criteria. The **Interest Rates Summary** page offers several icons that allow you to perform different functions when an interest rate curve is selected.

   - **Add**: Click **Add** to build a new interest rate curve. The **Add** icon is disabled if any row in the pane is selected.
   - **View**: Select a single row in the table to enable the **View** icon. Click **View** to view the contents of an Interest rate curve in read-only format. The **View** icon is enabled only when a single **Interest rate curve** is selected in the table.
   - **Edit**: Select a single row in the table to enable the **Edit** icon. Clicking the **Edit** icon allows you to modify a previously saved Interest rate curve. The **Edit** icon is only enabled when a single row is selected.

     You can control the number of rows to display on the window by selecting the Pagination Options icon from the action bar.
   - **Delete**: Select one or more rows out of the table to enable the **Delete** icon. Clicking on the Delete deletes the Interest rate curve you have selected.
   - **Copy**: Selecting a single row in the table enables the **Copy** icon. Click the **Copy** icon to create a copy of an existing Interest rate curve. The **Copy** icon is only enabled when a single Interest rate curve is selected.
   - **Check Dependencies**: Select an interest rate curve and then click the **Check Dependencies** icon to generate a report on all rules that utilize your selected interest rate curve.

     The **Check Dependencies** icon is only enabled when a single interest rate curve is selected.
   - **Execute the Historical Interest Rates Data Loader**: This icon executes a function to import historical rates and parameters for all defined Interest rate curves. For more information on setting up the automated process, see the OFS Data Model Utilities User Guide.

     `FusionApps.properties` file must be present under Web Server `<deployed path>/WEB-INF/props and $FIC_WEB_HOME/webroot/WEB-INF/props` directories.

     Update the entry details of the source name. It must be `infodom_SOURCE_NAME=Actual_Source_Name`.

     For example, if Infodom Name is `DEV6INFO` and the source Name is `DEVETLSRC`, then the entry will be `DEV6INFO_SOURCE_NAME=DEVETLSRC`.

     Launch the Historical Interest Rates Data Loader from the Interest Rates Summary page after making this change.

For more information, see Doc ID 2233513.1.

To execute a historical Interest Rate data load, execute the **Historical Interest Rates Data Loader**. A warning message will appear *Upload all available Interest Rates and Parameters?* Click **Ok** to load all historical rates and parameters.

Click **Data Loader** to execute all the interest rates and parameters.

3. To select an **Interest rate curve**, select a check box in the first column of the table. More than one Interest rate curve can be selected at a time, but this disables some of the icons.

   You can select or deselect all the Interest rate curves in the Summary page by selecting the check box in the upper left-hand corner of the Summary table directly to the left of the Code column header.

   The following list provides the Interest Rate details based on the search criteria.

   - **Code**: Displays the interest rate curve's code. The code is a unique number in the range of 1 to 9999999. Hover on a row in the pane to display the interest rate curve's detailed description.
   - **Name**: Displays the interest rate curve's short name.
   - **Rate Format**: Displays the Interest rate curve's rate format (zero-coupon or yield-to-maturity).
   - **Compound Basis**: Displays the Interest rate curve's compounding basis (Annual, Semiannual, Monthly, or Simple).
   - **Accrual Basis**: Displays the Interest rate curve's Accrual Basis (that is, 30/360, Actual/Actual, and so on).
   - **Currency**: Displays the Currency (Reference Currency) to which an Interest rate curve is applicable.
   - **Curve Type**: Displays the curve type as an Interest rate curve or Volatility Curve.
   - **Creation Date**: Displays the Date and Time at which an Interest rate curve was created.
   - **Created By**: Displays the Name of the user who created the Interest rate curve.
   - **Last Modification Date**: Displays the Date and Time at which an Interest rate curve was last modified.
   - **Modified By**: Displays the Name of the user who last modified the Interest rate curve.

10.2 Interest Rates Details

When you **Add**, **Edit**, or **View** an interest rate curve, the **Interest Rate Code Details** window is displayed. The **Interest Rate Code Detail**s window includes an **Interest Rate Code Details** pane, five **Interest Rate Code** tabs, and an **Audit Trail** pane.

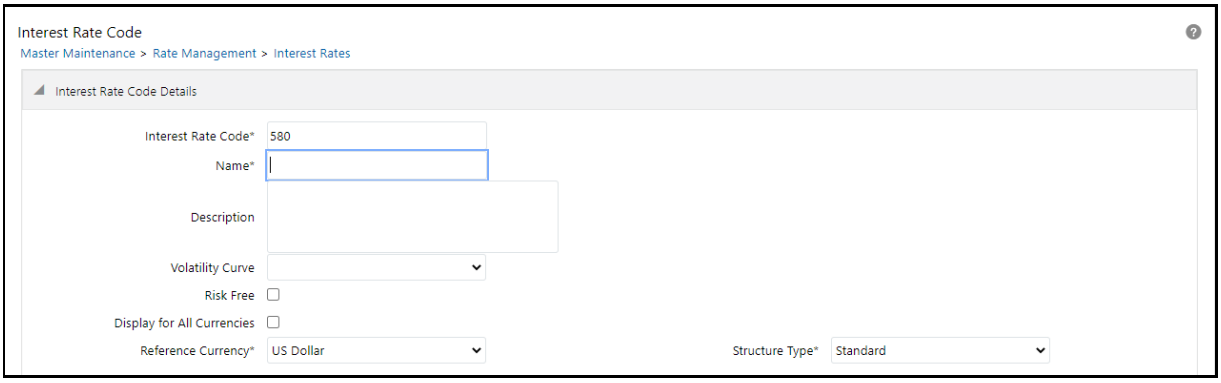
The **Audit Trail** pane is a standard footer pane for every OFSAA rule type. The **Audit Trail** pane displays **Created By**, **Creation Date**, **Last Modified By**, and **Modification Date**. The **User Comments** tab can be used to add comments to any rule, subject to a maximum of 4000 characters.

10.2.1 Creating an Interest Rate Code

To create an Interest Rate Code, follow these steps:

1. Click Add from the Interest Rate Code Summary page.

Figure 54: Interest Rate Code Details window



2. Enter the following information in the Interest Rate Code window.

   - **Interest Rate Code**: When constructing a new yield curve, you must specify an Interest Rate Code between 1 and 9999999. Interest Rate Codes are used internally to uniquely identify yield curves. When working with Rate Management or other OFS Analytical Applications, you reference yield curves by Name, not by Interest Rate Codes. Interest Rate Codes are embedded within your instrument data (for example, the INTEREST_RATE_CD and T_RATE_INT_RATE_CD columns within the instrument data are populated with Interest Rate Codes). After you have saved a yield curve, you cannot renumber its Interest Rate Code.
   - **Name and Reference Currency**: You must provide a Name and Reference Currency for your yield curve. Unlike Interest Rate Codes, you can rename or change the Reference Currency for previously saved yield curves. While you can choose to rename a yield curve, however, it is very unlikely that you will choose to modify a yield curve's Reference Currency. A yield curve's Reference Currency is the currency for which your market rates are valid. For example, the Reference Currency for a Prime Rate yield curve would be US Dollars. LIBOR or other internationally quoted rates are always quoted with respect to an underlying Reference Currency (for example, US Dollar LIBOR, Euro LIBOR, and so on). The Reference Currencies drop-down list displays only Active currencies. For more information on Active and Inactive currencies, see the Currency section.
   - **Description**: You can optionally describe or modify your yield curve's description at any time.
   - **Structure Type**: This attribute is required for each yield curve. Structure Type supports both Standard and Hybrid yield curve definitions. Hybrid yield curves are re-expressions of one or more pre-existing Standard yield curves. For more information, see Hybrid Term Structure Tab under Interest Rate Code Tabs. After you have saved the yield curve, you cannot change the selected Structure Type.
   - **Volatility Curve**: You can select the Volatility Curve option to indicate the curve selected will contain volatility rates. If you select this option, all other curve attributes become disabled and the curve is used exclusively for managing volatility details. For FTP Volatility,

both the Terms tab and Historical Rates tab are available with this option. For ALM Volatility, only the Historical Rates tab is available. After you have saved the yield curve, you cannot change the selected Volatility Curve.

Volatility curves are used in FTP to calculate the Rate Lock Option Costs. ALM Volatility is used to evaluate embedded options for the Black 76 market valuation.

- **Risk-Free**: (Optional) This flag is for tagging IRCs as risk-free. That is editable in new and edit modes. It is available for non-hybrid curves and hybrid curves, and not available for Volatility Curves.
- **Display for all currencies**: This option allows you to designate certain Interest rate curves to make them available for assumption mapping to any currency. Assumption rules filter the list of Interest Rate Codes based on the currency when defining assumptions for a specific product/currency combination. When this option is enabled, the Interest Rate Code appears in assumption rules for all currencies.

3. Click **Save**. To build out the Interest Rate Code, you must enter data within the Interest Rate Code tabs. For more information, see the Interest Rate Code Tabs section.

10.2.2 Interest Rate Code Tabs

Interest Rate Code tabs are used to define the yield curve and to add, edit, or delete historical interest rate data. The Interest Rate Code tabs are:

- Attributes
- Terms
- Historical Rates
- Parameters
- Hybrid Term Structure

10.2.2.1 Navigating Between Interest Rate Code Tabs

For new yield curves, you must begin with the Attributes tab. After you have selected attributes for a yield curve, you can not edit them. After assigning the attributes, navigate to the Terms tab to define a term structure for your yield curve or volatility curve, that is, an overnight rate, a one-month rate, a three-month rate, and so on. To navigate to the Terms tab, either click Apply on the Attribute tab or click the Terms tab.

> **NOTE** You must specify an Interest Rate Code, Name, and Reference Currency in the Interest Rate Code Details window before navigate to the Terms tab.

The first time you navigate to the Terms tab, an initial 1-month term point is provided, but even if this is the only term point you want for the curve, you must click Apply to finish the term structure specification. In future revisions to the curve's definition, navigate directly to the Historical Rates tab, but if you modify the term structure, you must always click Apply on the Term tab before navigating to the Historical Rates tab.

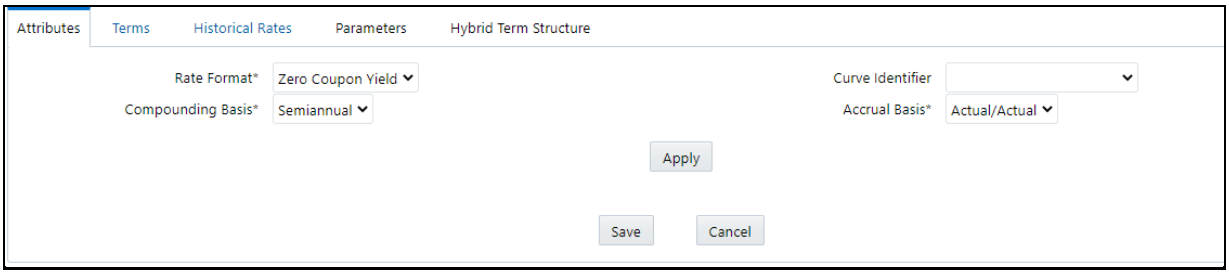
The Historical Rates tab is used to input interest rate or volatility data. This tab is used for maintaining the interest rates database. To navigate to the Historical Rates tab, either click Apply on the Terms tab or select the Historical Rates tab if you have already defined your term structure.

> **NOTE** You must specify the following before navigating to the Historical Rates tab:
>
> - an Interest Rate Code, Name, and Reference Currency in the Interest Rate Code Details window
> - a term structure in the Terms tab

10.2.2.1.1 Attributes Tab

Yield curve attributes include Rate Format, Compounding Basis, Accrual Basis, and Curve Identifier.

Figure 55: Attribute Tab of Interest Rate Code screen



All attributes are disabled if the Volatility Curve is selected. The following list describes the fields in the Attribute Tab of Interest Rate Code screen.

- **Rate Format**: To define the yield curve, you must select either the Zero Coupon or Yield to Maturity Rate Format. Rates entered into Rate Management (in the Historical Rates tab) are always entered in the nominal form, such as 5.125% or 6.875%, not as discount factors. For more information on how the two rate formats affect internal cash flow engine calculations, see the OFS Cash Flow Engine Reference Guide.
- **Compounding Basis**: Select a Compounding Basis for the yield curve: Annual, Semiannual, Monthly, or Simple. Annual is the most common method. The Monthly Option is enabled based on Rate Format selection (if Rate Format is selected as Yield to Maturity). For more information on Compounding Basis and how different compounding bases affect cash flow calculations in OFSAA, see the OFS Cash Flow Engine Reference Guide.
- **Accrual Basis**: Select an Accrual Basis for the yield curve. The Accrual Basis list depends on the Compounding Basis selection. If the Compounding Basis is selected as Annual, Semiannual, or Monthly, then the following Accrual Basis types are available:
  - Actual/Actual
  - 30/365
  - Actual/365

  If the Compounding Basis is selected as Simple, then the following Accrual Basis types are available:

- 30/360
- Actual/360
- Actual/Actual
- 30/365
- 30/Actual
- Actual/365

For more information on Accrual Basis and how different accrual bases affect cash flow calculations in OFSAA, see the OFS Cash Flow Engine Reference Guide.

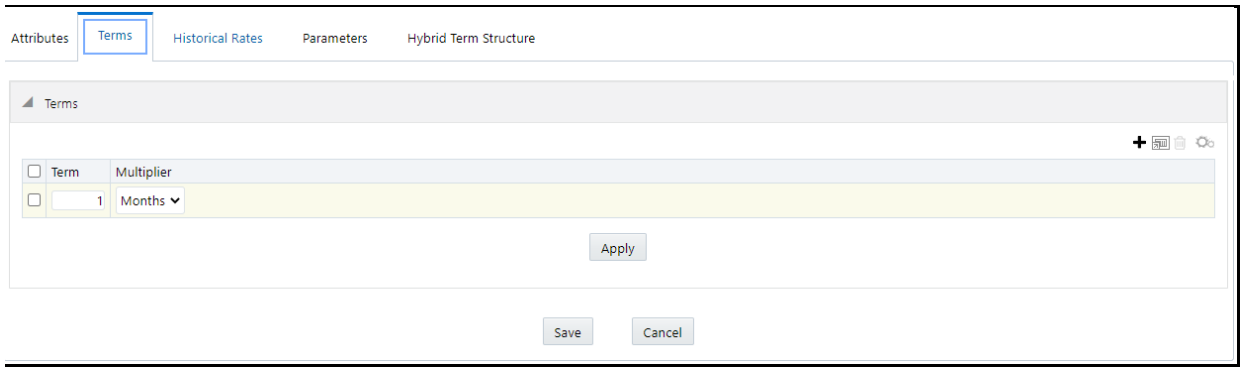
- **Curve Identifier**: The curve identifiers can be mapped to the Adjustable Rate Mortgage (ARM) indices used for ADCO prepayment model processing. This is a drop-down list that contains the six Curve Identifier types, that is, Par Treasury, Zero-coupon Treasury, Par LIBOR/Swap, Zero-coupon LIBOR/Swap, Prime Lending Rate, and Cost of Funds Index. The Reference Currency for these indices is always US Dollar.

  The curve identifier is optional when the IRC is not used for ADCO prepayment model processing. This is applicable only in ALM and HM applications.

10.2.2.1.2 Terms Tab

Use the Terms tab to construct the yield curve's term structure. You can specify as many yield curve terms from the 1 day to 100 years range.

Figure 56: Terms Tab on Interest Rate Code window



> **NOTE** When constructing a volatility curve, the term types available are Contract Term and Expiration Term. You must add the relevant terms for each of these dimensions. Click **Apply** after defining terms for each dimension to save the assumptions before proceeding.

- **Adding New Term Points**: Click **Add** to add new term points by selecting a Term value and a Multiplier (such as 7 days, 2 months, 5 years, and so on). You can also add term points using the Data Input Helper option. For more information, see the Data Input Helper section.

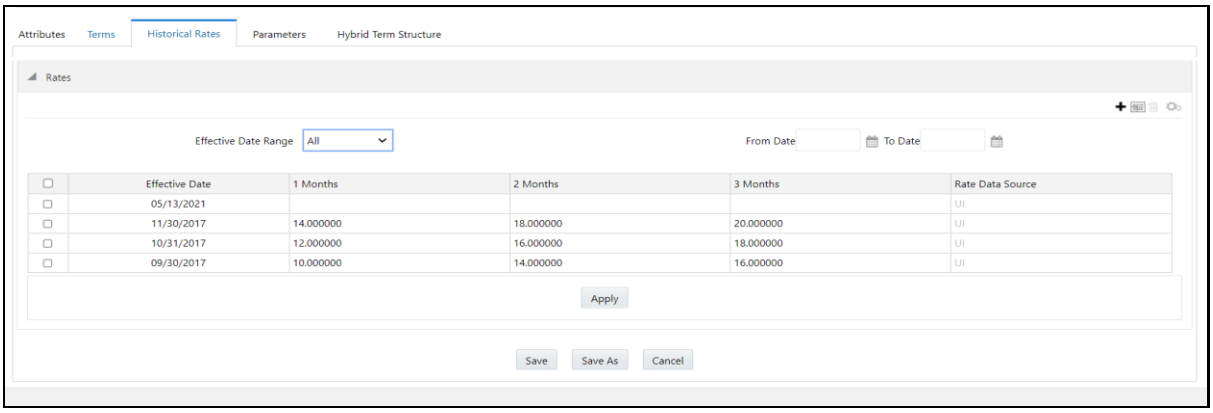
- **Deleting Existing Term Points**: To delete an existing term, select the term point (or terms), and click **Delete.** A confirmation message is displayed. Click **Ok**.

10.2.2.1.3 Historical Rates Tab

Use the Historical Rates tab to define, modify, or view interest rate data. Enter data in simple percentages (such as 5.125, 4.875, and so on). If you are entering historical rates for a volatility curve, then enter volatilities for the combination of Contract Term and Expiration Term. Select the desired Expiration Term from the drop-down list to complete the Volatility Matrix. Effective dates must be entered separately for each Expiration term in the list.

10.2.2.1.4 Historical Rates Tab on Interest Rate Code window

Figure 57: Interest Rate Code window - Historical Rates Tab



> **NOTE** FTP Volatility curves are only applicable to FTP Rate lock option cost calculations and ALM Volatility only applies to embedded option market valuation.

To enter historical rates for an FTP volatility curve, enter volatilities for the Contract Term. Select the desired Expiration Term from the drop-down list to complete the Volatility Matrix. Effective Dates must be entered for each Expiration Term.

To enter historical rates for an ALM Volatility Surface, enter volatilities based on the following two dimensions:

- Strike Rate (Vertical Axis)
- Expiration Date (Horizontal Axis)

For a new ALM Volatility Surface, enter an As of Date and the number of breakpoints for Strike Rate and Expiration Date, then click Generate. The size of the matrix cannot exceed 20 x 20. For Strike Rate, enter values in ascending order. For Expiration Date, enter values in ascending order with values greater than the currently specified As of Date. At every intersection of Strike Rate and Expiration Date, enter a volatility amount in percent (that is, 25 = 25%).

The Rate Data Source parameter shows from where the rates are taken from, either they are entered through the User Interface, loaded through the Data Loader, or generated using the Generate Rates of Hybrid IRC.

You can perform the following tasks:

- Add Historical Rates
- Rate Lookup Behavior Between Term Points
- Rate Lookup Behavior Beyond Term Points
- Rate Lookup Behavior Between Effective Dates
- Generate Graph
- Excel Import or Export
- Deletion of Historical Rates
- Data Input Helper

10.2.2.1.5 Add Historical Rates

By default, the Historical Rates tab displays interest rate data for the past month (for example, for the 30 days leading up to the current date). Click the Effective Date Range drop-down list to expand your view to the last 3 months, 6 months, one year, 3 years, 6 years, or all rate data.

10.2.2.1.6 Rate Lookup Behavior between Term Points

The OFS Cash Flow Engine is common to OFS FTP, OFS PMTPC, OFS ALM, and OFS BSP applications. To lookup rates from Rate Management, the Cash Flow Engine performs an interpolation between yield curve Term Points. For example, in determining a Straight Term Transfer Rate (common for products such as time deposits), the Engine must determine a three-month rate from a yield curve that contains only a one-month rate and a six-month rate. In such a case, the Cash Flow Engine performs interpolation to determine the implied three-month rate. While each of the applications supports simple linear interpolation, OFS FTP and OFS ALM also support Cubic and Quartic Spline interpolation methods. These more advanced methods will be supported for all the OFS Analytical Applications in a future release.

10.2.2.1.7 Rate Lookup Behavior Beyond Term Points

If the Cash Flow Engine must determine a rate from a yield curve for a term point smaller than the first term point of the yield curve, then the Engine utilizes the first term point of the yield curve. For example, if the Engine must determine an overnight rate from a yield curve whose first term point is one month, the Engine utilizes the one-month rate.

If the Cash Flow Engine must determine a rate from a yield curve for a term point greater than the longest term point on the yield curve, the Engine utilizes the last term point of the yield curve. For example, if the Engine must determine a 30-year rate from a yield curve whose last term point is 10 years, the Engine utilizes the 10-year rate.

10.2.2.1.8 Rate Lookup Behavior between Effective Dates

When you are looking up rates from Rate Management for a business date, the Cash Flow Engine helps to find if there is no rate data for that specific business date.

For example, in generating an original term transfer rate for an instrument with an origination date of June 14, 2010, the Cash Flow Engine may find rate data for May 31, 2010, and for June 30, 2010, but no rate data for any dates between May 31, 2010, and for June 30, 2010. In such cases, the Cash Flow

Engine always falls back to the latest available rate data before the business date of interest (May 31, 2010, in this case).

10.2.2.1.9 Deletion of Historical Rates

To delete historical rates entered, select one or more rows and then click Delete.

10.2.2.1.10 Generate Graph

The Generate Graph option allows you to generate the graph for selected Historical rates.

To generate a graph, follow these steps:

1. Select the Effective Date Range on the Historical Rates tab.

   The From Date and To Date fields will be automatically updated after selecting the Effective Date Range.
2. Select the Effective Date using the corresponding **Calendar** icon.
3. Enter the term points in respective fields and click **Apply**.
4. Select the **Terms** using the corresponding check boxes.
5. Click **Generate Graph**. The graph is generated. Here, you can view the graph for Interest Rate vs Effective Date or Interest Rate vs Term Point.

10.2.2.1.11 Excel Import or Export

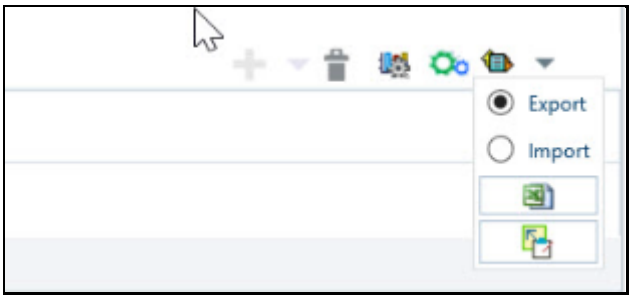
To aid in data entry, use the Excel Import or Export functionality to add or edit rate data to historical rates. This is an optional step.

Excel Export:

To export the data, follow these steps:

1. On the Interest Rates toolbar, click the **Excel** icon.
2. Click **Export** to export data for the chosen selected effective date range. Within the same block, select Export to Excel, which launches the Excel application and displays the data window including headers.

Figure 58: Export and Import options for Historical Rates data



Excel Import: You can add rows to the pane in the same format. After complete data is entered (or existing data is edited), copy the range of the pane you want to append and go back to the **Historical Rates** pane. In the same block, click the **Import**. The data copied from excel will appear in the **Historical Rates** pane.

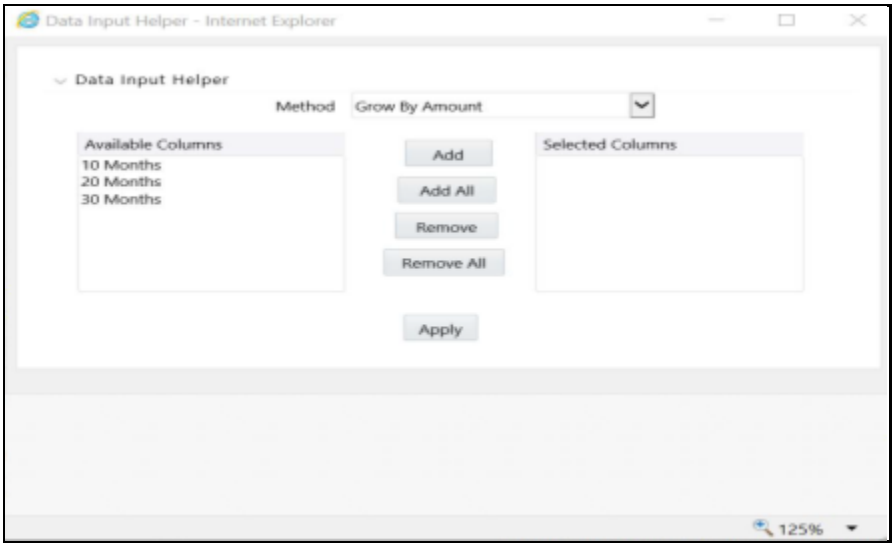
3. If appending data that pre-existed for the same effective date, the import will overwrite existing data.
4. In some cases, some fields will be output to the pane that is not editable, such as bucket start and end dates (when defining forecast assumptions). Add or edit data in the columns that would be editable only in the UI itself.

Data Input Helper

Use the Data Input Helper feature to copy from a row where you have already defined the interest rate definition or apply a fixed value down the page. This is an optional step. To use data input helper, follow these steps:

1. Select the check box next to the rows that you want to work with or use the Select All option by selecting the check box on the header row.
2. Select **Data Input Helper** ( ).
3. From the **Data Input Helper** window, select method - **Grow by Amount** or some other appropriate method.
4. Select the term points from the **Available Columns** list and click **Add** or **Add All** to move the data to the **Selected Columns** list.

Figure 59: Data Input Helper window



Based on the selected method, the list of Available Columns will vary. If Method is selected as Increment By Months, Increment By Days, or Increment By Years, then only the Effective Date option is displayed in the Available Columns list.

5. Click **Apply** to modify the Start date and enter the Incremental Value.

10.2.2.2 Parameters Tab

Fixed income instruments are used for forecasting and simulating the Cash Flows. The Cash Flow Engine needs interest rate models to simulate the evolution of interest rates. The Cash Flow Engine uses these models as part of the stochastic engine. You can enter the parameters for these models in the following ways:

- System-generated calculations through Parameter Estimation
- Direct input into the UI
- Excel Import
- UI entry through Data Input Helper methods
- Data Loader

The following interest rate models are available:

- Extended Vasicek
- Ho and Lee
- Merton
- Vasicek

10.2.2.2.1 Parameter Estimation

This section explains the procedure to calculate the estimated parameters.

Prerequisites

Installation of R and Oracle R Enterprise (ORE) is required to use the Term Structure Parameter Estimation functionality under Rate Management - Interest Rates, for computing term structure parameters.

For more information, see the OFS Advanced Analytical Applications Infrastructure Installation and Configuration Guide.

Conditions for Parameter Estimation: If the following conditions are met, you can calculate parameters for any Term Structure Model for a given Effective Date, based on your relative look back term and a sufficient number of observations (available historical rates) for the IRC. If you rerun with a different look-back term, it will overwrite the existing parameters for the selected Term Structure Model on that IRC's Effective Date.

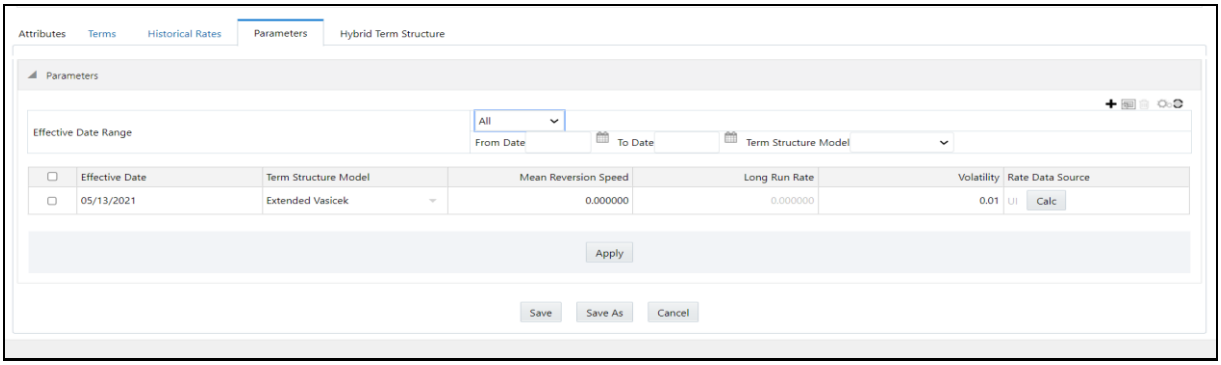
- **Term point**: Underlying historical rates must be available for a 30-Day or 1-Month term point.
- **Minimum Number of historical rates**: A total of at least 10 historical rates (observations) are required, on appropriate look-back dates.
- **Lookback Dates**: Historical rates must be available on dates looking back from the Parameter's Effective Date (the End Date), in 30-day intervals moving backward from End Date to Start Date, for a minimum of 10 intervals.

  For example: If the first rate's Effective Date is 1 Jan. 2013, then the second rate's date must be 2 Dec. 2012 (1 Jan. 2013, 30 days = 2 Dec. 2012), and so on. If a rate is not found for the required date, the engine looks for a rate within the neighborhood of 5 days up or down (therefore a total range of 10 days), searching iteratively starting with Date -1, then Date +1, through Date +5, then Date -5. The next rate lookup would be 60 days before the End Date, and so on.

  The minimum relative term for all lookbacks must be at least 300 Days (that is, to accommodate a minimum of ten 30-day intervals). Using the above logic, if a rate is not found for the lookup date (or date within the neighboring range), an error will be logged in FSI_PROCESS_ERRORS with ID_Number to identify the Interest Rate Code, and the parameter estimation Engine will exit.

To define the Parameter Estimation, follow these steps:

Figure 60: Parameters Tab on Interest Rate Code window



To edit or recalculate the existing Parameters, enter the Effective Date Range filter.

1. The following icons are available here:
   - Add
   - Delete
   - Data Input Helper
   - Refresh
   - Excel Export or Import
2. Default parameters for the **Extended Vasicek Model** are displayed for one Effective Date (the System Date on which the Interest Rate Code was created). You can edit these parameters or add new parameters using the **Add**. Use the **Refresh** to return to existing Parameters.

> **NOTE** Steps 3 and 4 are applicable only if you are Adding or Editing Parameters.

   To add or edit the parameters, use the **Data Input Helper** or **Excel Import or Export**. For more information, see the Excel Import or Export and Data Loader sections.
3. Enter the **Effective Date**. Note that the **Effective Date** cannot be greater than the **Current System Date**.
4. Select the Model from the **Term Structure Model** drop-down list. Effective Date and Term Structure Model combination must be unique within this IRC.
5. The following term structure models are utilized in stochastic modeling of interest rates in OFS FTP and OFS ALM:
   - Extended Vasicek
   - Ho and Lee
   - Merton
   - Vasicek
6. The following parameters are needed by the models:

Figure 61: List of supported parameters for Models Term structure models in Interest Rate

Model	Parameter 1	Parameter 2	Parameter 3
Extended Vasicek	Volatility	Mean Reversion Speed	
Ho and Lee	Volatility		
Merton	Volatility		
Vasicek	Volatility	Mean Reversion Speed	Long Run Rate

7. Values for Long Run Rate and Volatility are in percentages.

   For example, a Long Run Rate of 5% is displayed as 5.000. To maintain the integrity of data, Rate Management restricts the accepted input values. The valid range and the default setting for each parameter.

Figure 62: Valid Range and Default Values of Interest Rate Parameters

Parameter	Valid Range	Default Value
Volatility	0% to 500%	0.01
Mean reversion speed	0.00 to 500	0.0
Long run rate	0.00% to 500%	0.0

8. The **Rate Data Source** indicates if you have directly entered Parameters through the UI. You can calculate the Parameters to display system-generated values.
9. Select Calculate to view the Term Structures Parameter Estimation window.
10. If you are directly entering the Parameters, then enter values appropriate to the Model, then click **Apply** else click **Calculate**.
11. The End Date is auto-populated with the Effective Date. Enter the Relative Term with Multiplier to define the rate look-back period.
12. The Term or Multiplier value must be at least 300 Days.
13. The Start Date is automatically updated after entering a Relative Term.
14. Click **Calculate Number of Observations** to confirm the number of rates found for appropriate dates within the Relative Term. If there are at least 10 observations, then the **Estimate** option will become active.
15. Click **Estimate** to calculate the parameters and store them in the Historical Parameters table (FSI_IRC_TS_PARAM_HIST). A confirmation message is displayed. Click **Ok**. The calculation will complete and you will be directed back to the Parameters tab.
16. Similar to the validation used for direct input from the UI, if any of the calculated parameters are outside of the valid range, the Engine displays an error message.

Delete parameters by selecting one or more rows and then clicking **Delete**. For more information on term structure models and stochastic processing, see the OFS Funds Transfer Pricing User Guide, OFS Asset Liability Management User Guide, and OFS Cash Flow Engine Reference Guide.

10.2.2.3 Hybrid Term Structure Tab

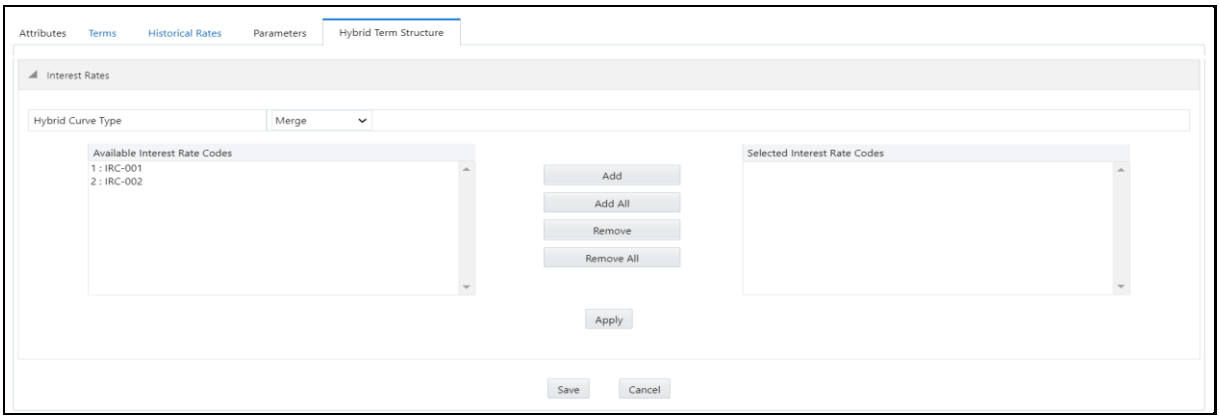
Hybrid Term Structures allows you to specify the following three types of Hybrid yield curves:

- Spread
- Moving Average
- Merge

> **NOTE** Minimum and Maximum Hybrid IRC types from the Hybrid IRC type selection are intended for future enhancement and must be ignored in the current release.
>
> The Parameters and Hybrid Term Structure tabs are disabled if the Volatility Curve is checked.

Hybrid yield curves are built up from either one or more standard yield curves. When you add, modify, or delete any historical rate data from a standard yield curve, the data associated with any related hybrid yield curve must be updated. After defining, the Hybrid yield curves can be used like any other interest rate curve in the system. You can reference these curves within the OFSAA application business rules that allow the selection of an Interest Rate Code.

Hybrid Curve tab on Interest Rate Code window



Hybrid Curve Type: Spread: A Spread hybrid yield curve is defined as the difference between two standard yield curves. The Spread type of hybrid yield curve is useful in establishing liquidity risk or basis risk yield curves.

- **Moving Average**: Moving average hybrid yield curves represent moving average data of a single underlying standard yield curve. These curves are used in Funds Transfer Pricing.
- **Merge**: Merge hybrid yield curves represent a blending of two or more underlying yield curves. In constructing a Merge type of hybrid yield curve, specify the percentage weighting applied to each of the underlying standard hybrid yield curves.

10.2.2.3.1 Define a Hybrid Curve

To define a hybrid curve, follow these steps:

1. Select the **Source Type** as **Hybrid** in the **Hybrid Term Structure** tab, and then select the **Hybrid Curve Type** (Spread, Moving Average, or Merge).
2. Select the **Interest Rate Codes** for the hybrid type and click **Apply**.

10.2.2.3.2 Generate Historical Rates

After a hybrid curve is defined, generate the Historical Rates as far back as the rate source curves allow. The Generate Frequency determines the frequency of the historical rates populated with the Generate function. If you select the Generate Frequency as monthly, it generates month-end values only. If you select daily, it generates the maximum number of historical values.

To generate the rates, follow these steps:

1. Select the interpolation method as **Linear**, **Cubic**, or **Quartic**.
2. Select the **Generate Frequency** (Daily, Weekly, Bi-Weekly, or Monthly) and enter the **Specific Date Range** (From Date and To Date).
3. Click **Generate**. The rates will be populated and you will be directed to the Historical Rates tab to view the results.

   If **Hybrid Curve Type** is selected as **Moving Average,** then select the **Moving Average Term** in Days, Months, or Years.

10.2.2.3.3 Automate (Schedule) the Generate Rates Action in Hybrid IRCs

The generation of the Hybrid IRC rates is available within the Hybrid IRC of Rate Management UI. As a manual process, you can additionally schedule a Run thorough ICC Batch process or a Simplified Batch process.

If you are running Generate Rates through the UI, then provide the following three parameters:

- **Interest Rate Code**: For example, you are in edit mode for a particular Hybrid IRC, execute the Generate Rates option. So, the IRC is implied.
- **FROM DATE**: this is the start date of the generate rates process.
- **TO DATE**: this is the date to which hybrid rates will be computed.

When generating Hybrid Rates through a batch (ICC or Simplified), specify ALL in the Parameter list to generate rates for all Hybrid IRCs. Or, a list of IRCs can be specified with comma-separated values within quotes.

'IRC_Code1, IRC_Code2, IRC_Code3' and so on.

> **NOTE** Use ALL in the Parameter list for all IRCs.

The **TO DATE** is determined based on the Effective Date specified for the Batch and the **FROM DATE** for each IRC is determined by referring to the last (maximum) effective date in the current historical rates table +1 day.

There is one exception to the calculated FROM DATE. In cases where a new Hybrid IRC is generating rates for the first time, the minimum Effective Date from the Parent IRC is used as the FROM DATE.

> **NOTE** Hybrid Rates generated by the Generate Rates procedure are written to the FSI_IRC_RATE_HIST table. Outputs from the procedure can be verified within the Interest Rates UI or by querying this table directly.

Topics:

- Dependent Tables
- Prerequisites to running - Hybrid IRC batches
- Batch Creation and Running Batches
- Viewing Log Messages

Dependent Tables

The following list describes the details of the Dependent Tables.

- **FSI_IRCS**: Holds header information of all Interest Rate Codes.
- **FSI_IRC_HYBRID_STRUCT_WEIGHT**: Holds the Hybrid IRCs' - Interest Rate Term, Interest Rate Term Mult, and Rate Weightage. It is the child Table of FSI_IRCS.
- **FSI_IRC_RATE_HIST**: This Output table holds calculated rates for the Hybrid IRCs, as well as all historical rates for non-hybrid IRCs input through the Interest Rates UI or loaded directly using the interest rates data loader program.
- **FSI_MESSAGE_LOG**: Holds error log information.
- **DATE_TASK_MASTER**: Located in the Config Schema. This table must have a seeded date for IRC_HYBRID_SCHEDULER DT.
- **DATE_TASK_STEP_PRECEDENCE**: Similar to DATE_TASK_MASTER, this table must also have an entry for IRC_HYBRID_SCHEDULER DT.

Prerequisites to Running Hybrid IRC Batches

- The function FN_FSI_IRC_HYBRID_SCHEDULER must be in Compiled status in the Atomic schema. Sometimes, the functions created in the Database can be in an invalid state due to some issues (by the installer), so use the Compile option in the Database to get them in a valid state.
- You can create the ICC batch using the IRC_HYBRID_SCHEDULER rule name, which is seeded with the installation.
- Hybrid IRC rates are calculated based on their underlying standard IRC rates, which are also stored in the FSI_IRC_RATE_HIST table. Historical Rates must already exist for all parent and dependent IRCs for the relevant effective date range.

> **NOTE** Seeded data related to Batch information must be present in the DATE_TASK_MASTER and DATE_TASK_STEP_PRECEDENCE tables in the Config schema.

10.2.3 Batch Creation

There are two methods for creating and running the batch processes, ICC Batch and Simplified Batch. The following section describes how to set up and run the Hybrid Rate Generation using both approaches.

For more information, see the OFS Analytical Applications Infrastructure User Guide.

Running Hybrid Rate Generation using ICC Batch:

1. Navigate to **Common Object Maintenance**, select **Operations**, and then select **Batch Maintenance**. Click **Create Batch**.
2. Enter the following details in the Batch Maintenance window:

   Component = "Transform Data"

Rule Name = "IRC_HYBRID_SCHEDULER"

Parameter List = 'IRC_Code'

> **NOTE** Use ALL in the Parameter list to use all IRCs.

3. Save the batch.
4. Navigate to **Common Object Maintenance**, select **Operations**, and then select **Batch Execution**.
5. Search the **Batch** created under **Batch Maintenance** and select it.
6. Enter the **Information Date** for the batch.
7. Click **Execute Batch**.

   To schedule a future Hybrid Rate Generation Batch Process, or to schedule the Hybrid Rate Generation Batch Process on a recurring basis, do the following:
8. Navigate to Common Object Maintenance, select Operations, and then select Batch Scheduler.
9. Search the Batch to schedule and select it.
10. Click New Schedule or Existing Schedule:

> **NOTE** An Existing Schedule can be selected only if there are existing scheduled batches to view.

11. If New Schedule is selected, the New Schedule details appear. Enter the Scheduled Task Name.

    To schedule the Hybrid Rate Generation on a recurring basis, select Daily, Weekly, Monthly, or Adhoc.
12. In the Schedule Task pane, enter **Start Date** and **End Date** in the Date field.
13. In the **Run Time** field, enter the time for the next validation to be run.
14. Click **Save** to set the schedule as specified or Cancel to drop your changes.

    Any error messages or warnings generated during the Hybrid Rate Generation process that is displayed in the View Log.

    For more information, see the OFS Analytical Applications Infrastructure User Guide.

10.2.3.1 Running Hybrid Rate Generation using Simplified Batch

To run Hybrid Rate Generation using Simplified Batch, follow these steps:

1. Navigate to **Common Object Maintenance**, select **Operations**, and then select **Simplified Batch**.
2. Click **Add**.

3. From the **Task Details** pane, click **Select Task**. In the Task Selection window, select **Task Type** as **Transform Data**. Click **Search**. In the Task Selector, select the **IRC_HYBRID_SCHEDULER** and click **Ok**.
4. Enter the Parameters and click **Save**.
5. In the **Simplified Batch Summary** page, search the **Hybrid Rate Generation** batch, and select it. Click the **Run** icon.
6. Click **Yes** to confirm you want to continue, enter a date (this will be your TO DATE), and click **Ok** to continue. A confirmation message is displayed.
7. Click **Ok**. When the batch is complete, navigate to **Operations** and select **View Log** to view the processing log.

Any error messages or warnings are accessible from the View Log window.

> **NOTE** Simplified Batch does not provide access to logs for Transform Data tasks.

For more information, see the OFS Analytical Applications Infrastructure User Guide.

10.2.3.2 Viewing Log Messages

Any error messages or warnings generated during the rate generation batch are displayed in the Log Information window. To access this window:

1. Navigate to the Operations menu and select View Log.
2. Enter search criteria as Data Transformation and related Batch ID
3. Select the Task ID to view the log information

   You can additionally query the FSI_MESSAGE_LOG table directly to view the error log details.

   For more information, see the OFS Analytical Applications Infrastructure User Guide.

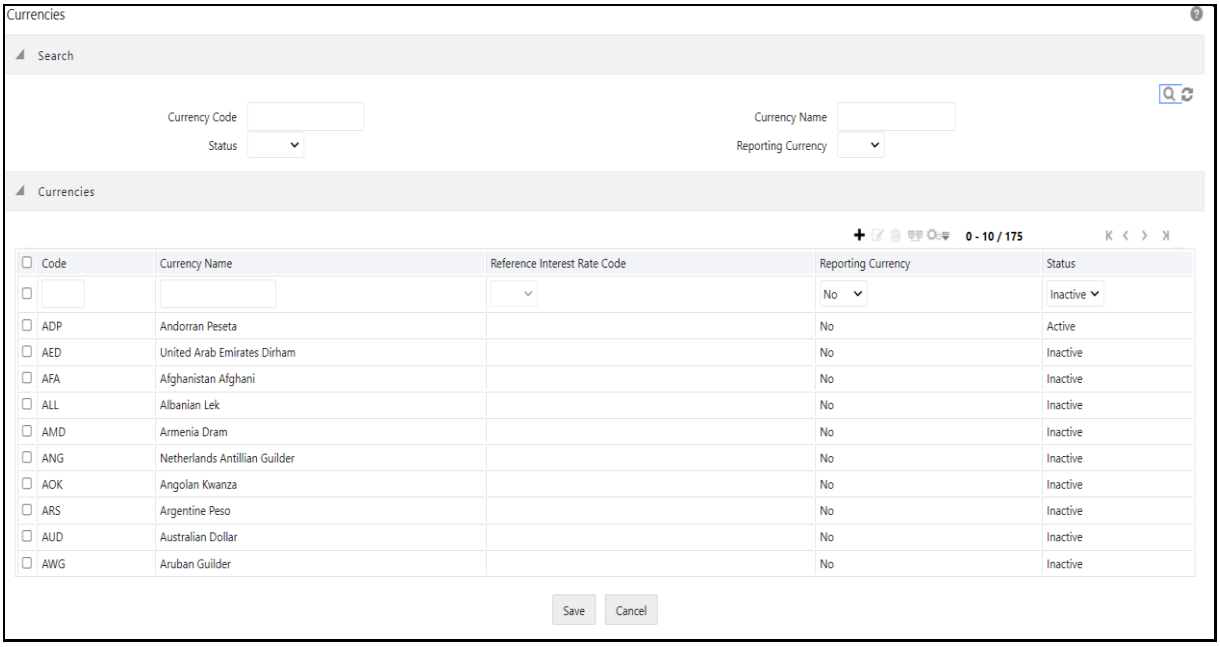
10.3 Currency

Financial institutions transact business in more than one currency. Transacting business in multiple currencies demands functional capabilities for multi-currency accounting and currency rate management.

OFSAA Rate Management's Currency module supports the definitions and maintenance of currencies. Currency definitions are fundamental to the definition of both interest rate yield curves and currency exchange rates. A key attribute of every yield curve is the currency with which it is associated, and currency exchange rates can only be established between defined currencies. OFSAA Rate Management provides a comprehensive list of ISO-defined currencies; you can also define and add your user-defined currencies.

To view the Interest Rate Code Summary page, navigate to Common Object Maintenance and select Rate Management, and then select Currency. This page displays a comprehensive list of more than 170 seeded ISO currency codes.

Figure 63: Currency Summary page



10.3.1 Searching for Currency

A Search pane is provided to search for currencies by Name, Currency (by ISO currency code), Status, or Reporting Currency.

To search the currency, follow these steps:

1. Enter the search criteria and click **Search**.
2. Click the **Reset** to remove the search criteria you have specified and refresh the window.
3. The search results are displayed in a tabular format containing all of the currencies that meet to search criteria. The Currency summary pane offers several icons as follows to perform different functions when a currency is selected.
   - **Add**: Click **Add** to begin the process of adding a new currency. The **Add** icon is disabled if any rows in the pane are selected.
   - **Edit**: Select a single row out of the pane to enable the **Edit**. Click the **Edit** icon to modify an existing currency. The **Edit** icon is only enabled when a single currency has been selected.

     You can control the number of rows to display on the page by selecting the Pagination Options icon from the action bar.
   - **Delete**: Select one or more rows out of the pane to enable the **Delete** icon. Click the Delete icon to delete the currency or currencies you have selected.
   - **Check Dependencies**: Select a currency and then click the **Check Dependencies** icon to generate a report on all rules that utilize your selected currency.

     The **Check Dependencies** icon is only enabled when a single currency has been selected.

4. The **Currencies** window contains all of the currencies that meet the search criteria. The Currencies Summary page has several icons to perform different functions when a currency is selected.

   To select a currency, select the check box in the first column of the pane. More than one currency can be selected at a time but this will cause some of the icons to become disabled. Select a check box a second time deselects the currency.

   Select or deselect all of the currencies in the Summary page by selecting the check box in the upper left-hand corner of the Summary page directly to the left of the Code column header.

   The following list provides the currency details based on the search criteria:

   - **Code**: For seeded currencies, these are ISO Currency Codes. For user-defined currencies, these can be any pure character string (no numbers) up to a length of 3 characters.
   - **Currency Name**: For seeded currencies, these are ISO Currency Codes. For user-defined currencies, these can be any string up to a length of 40 characters.
   - **Reference Interest Rate Code**: Reference Interest Rate Code is the Interest Rate Code with which currency is associated with forecasting purposes. Define multiple yield curves each of which has the same Reference Currency, but a currency can only have one Reference Interest Rate Code.
   - **Reporting Currency**: A reporting currency is an active currency to which balances in other currencies can be consolidated to facilitate reporting. Balances in reporting currencies can be, in turn, consolidated to the functional currency. For example, an American multinational bank might consolidate its holdings in Asian currencies to the Japanese yen (Reporting Currency) and its balances in European currencies to the Euro (Reporting Currency) after which it might consolidate these reporting currencies to the U.S. dollar (Functional Currency).
   - **Status**: The status of any currency can be either Active or Inactive. You must Activate a currency before doing the following:

     Define that currency as a Reference Currency for a yield curve (For more information, see the **Reference Currency** section in the Interest Rates Details window.)

     Enter Exchange Rate data for a currency (For more information, see the Currency Rates section.)

     Define Forecast Rates for that currency within OFS ALM (For more information, see the Forecast Rates section).

10.3.2 Editing Currencies

To edit a currency, select a currency, click **Edit**. You cannot modify any currency Code value. You can modify the Currency Name, Reference Interest Rate Code, Reporting Currency value (Yes or No), and the currency's Status (Active or Inactive).

You cannot inactivate any currency that is:

- Defined as the Reference Currency for any yield curve
- Associated with any exchange rate data
- Utilized within any Forecast Rates rule within OFSAA Asset/Liability Management

After completing the edits, click **Save**.

10.3.3 Adding Currencies

To add a currency, follow these steps:

The first row in the Currencies window is an empty row that is ready for you to edit as a new currency. Select this empty row, click Edit, and generate the new currency.

or

Generate a new currency by clicking **Add**. This generates another empty row at the top of the Currencies window to edit purpose.

10.3.4 Deleting Currencies

Select one or more currencies and then click **Delete**. You cannot delete any currencies that are utilized elsewhere in the system.

10.4 Currency Rates

OFSAA Rate Management's Currency Rates module uses the currencies defined and activated in the Currency module to support the creation and maintenance of historical exchange rates. Currency exchange rates are utilized in:

- OFS Funds Transfer Pricing Ledger Migration processes
- OFS Asset Liability Management Currency Consolidation process (see the OFS Asset Liability Management User Guide)
- OFS Profitability Management multi-currency allocations.
- OFS Hedge Management and IFRS Valuations (see the Oracle Hedge Management and IFRS Valuations User Guide)

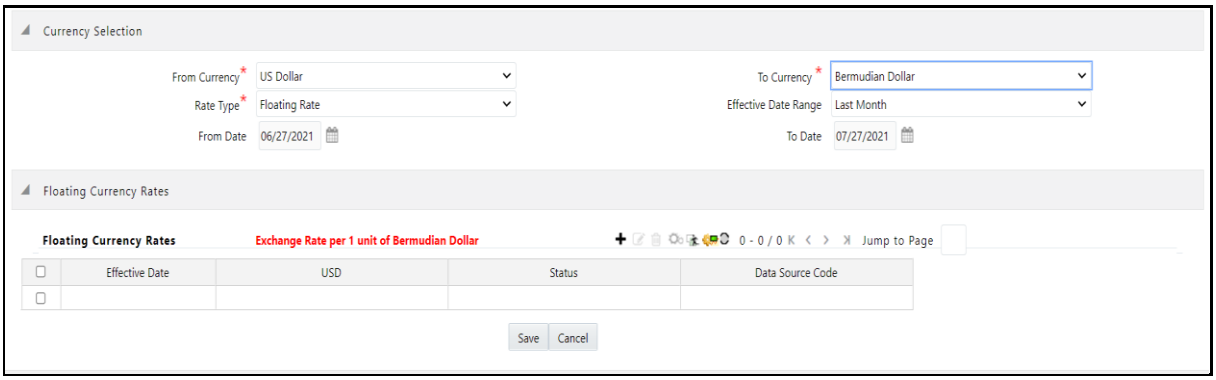
To view the Currency Rate, navigate to **Common Object Maintenance**, select **Rate Management**, and then select **Currency Rates**. In this window, you can manage historical exchange rates between currencies.

For ALM, FTP, and PFT, From Currency defaults to the Initial Currency selection from the Assumption Management defaults in the active Application Preferences window. You can select another From Currency from the drop-down list that displays all Active currencies.

10.4.1 Preparing to Work with Exchange Rate Data

To view, edit, or delete the exchange rate data, you must enter the **To Currency** value. With the From Currency, the To Currency drop-down list displays only Active currencies.

Figure 64: Currency Rates Summary page



After selecting a To Currency value, select a value for Rate Type as Floating Rate or Fixed Rate (the default selection is Floating Rate). After selecting a To Currency value, a second pane is displayed as Floating Currency Rates (if you have chosen a Rate Type of Floating Rate) or Fixed Currency Rates (if you have chosen a Rate Type of Fixed Rate).

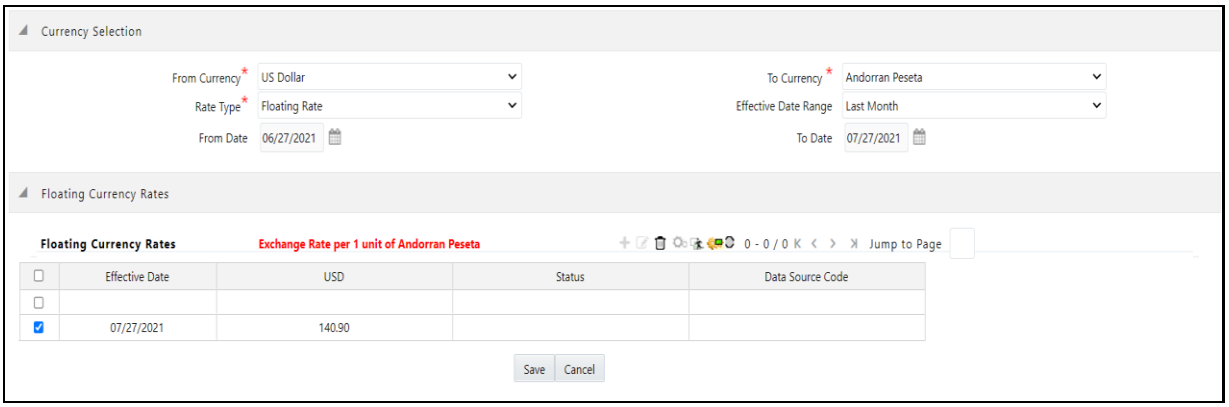
- **Floating Rates**: Floating exchange rates, such as those between the US Dollar (USD), the Pound Sterling (GBP), the Japanese Yen (JPY), and the Euro (EUR), are market-driven and can change from day-to-day, hour-to-hour, or minute-to-minute.
- **Fixed Rates**: Some countries, especially smaller countries or countries that have experienced significant inflation in the recent past, can wish to "peg" their currency to a larger, more stable currency such as the US Dollar, Japanese Yen, or Euro.

10.4.2 Adding Exchange Rate Data

After you have specified a value for **To Currency**, the Floating Currency Rates section appears. To define a Fixed Rate relationship, select the Fixed Rate Type and replace the Floating Currency Rates with the Fixed Currency Rates.

Both Currency Rates panes initially display a single blank row followed by the most recent month's exchange rate data (if any such exchange rate data already exists). To enter a single new exchange rate data point, enter data into the blank row, and click **Save**.

Figure 65: Defining a Currency Rate



The following list describes the columns in the Currency Rate window:

- **Effective Date**: Directly enter a date or select the Calendar ( ) icon to choose an effective date for your new exchange rate data point.

  Rate Management stores the historical exchange rate data. You cannot enter exchange rate data for dates greater than the current date. For more information regarding rate forecasts and the relationship between historical exchange rates for forecasted exchange rates, see the Forecast Rate Scenarios. If you have gaps in the historical exchange rate data, any OFS Analytical Application that needs to perform a rate translation function will fall back to the most recent date for which exchange rate data exists. For example, if an OFS Analytical Application needs to translate a rate from USD to EUR for February 22, 2010, and the latest available USD to EUR rate data in the Rate Management database is February 11, 2010, then the application will utilize the exchange rate for February 11, 2010.

- **Status**: Status is a read-only display that is updated after the Currency Rates Validation has been run.

- **Data Source Code**: The Data Source Code is displayed read-only and indicates whether the rates were input through the UI or the data loader.

- **Currency Exchange Rate**: For both Floating Rates and Fixed Rates, units of the From Currency are converted to one unit of the To Currency. See Table 12 for example.

Figure 66: Example of one Currency to another Currency Conversion

From Currency	To Currency	Approximate Rate
USD - US Dollar	GBP-Pound Sterling	1.50
USD - US Dollar	EUR - Euro	1.36
USD - US Dollar	JPY - Japanese Yen	0.01105

10.4.3 Adding Multiple Exchange Rates

Click **Add** to add additional blank rows to enter the additional Effective Dates and Exchange Rates. After adding the multiple new exchange rates, click Save.

10.4.4 Editing Exchange Rate Data

Select the check box on the left-hand side of any row to enable the **Edit** icon. After clicking Edit, the row becomes active to edit the **Effective Date** and (or) the **Exchange Rate**. Click **Save** to save the changes.

10.4.5 Viewing Exchange Rate Data

By default, both the Floating Currency Rates pane and the Fixed Currency Rates pane display the most recent month of historical exchange rate data. You can control the amount of data displayed by selecting a different value from the Effective Date Range drop-down list in the Currency Selection window.

Click the **View** icon to a specific range of effective dates by modifying the From Date, To Date, or both dates within the Currency Rates window.

10.4.6 Deleting Exchange Rate Data

Select one or more check boxes on the left-hand side of any row to enable the **Delete** icon. After clicking **Delete**, a confirmation message is displayed. Click **Ok**.

10.4.7 Data Loader

The Data Loader icon executes a function to import historical Currency rates for all defined Currencies. For more information on setting up the automated process, see the OFS Data Model Utilities User Guide.

To execute a data load, click the **Data Loader** icon. A warning message is displayed Upload all available Currency Rates?

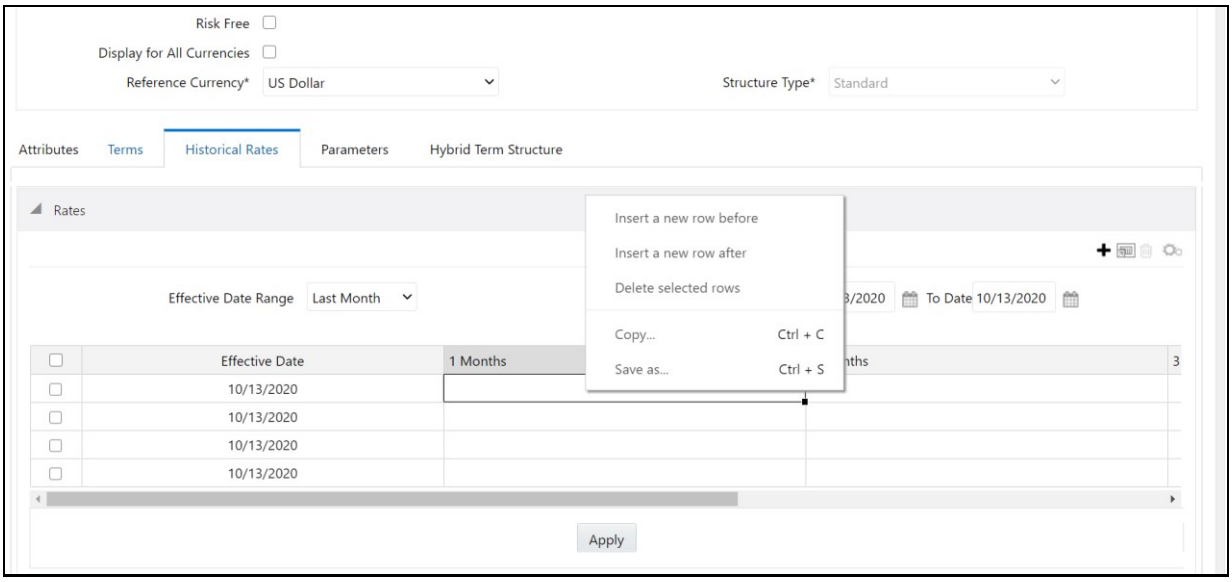
Click the **Data Loader** icon to execute all the currency rates.

10.4.8 Excel Compatibility

This functionality is used for adding or editing historical exchange rates from an Excel sheet. You can right-click on any cell in the table and perform the following actions:

- Delete or Insert multiple rows
- Apply a Formula on a particular column
- Export the data to excel using the **Save As** option.
- You can copy data from excel and paste the same using standard copy, paste shortcuts **Ctrl+C** and **Ctrl+V**.

Figure 67: Historical Rates Tab



10.5 Currency Exchange Rate Validation

Exchange Rate Validation has the following features:

- Movement of historical exchange rates to the Currency Direct Access table.
- Calculation of inverse exchange rates for reporting currencies.
- Calculation of triangulated exchange rates where possible.

> **NOTE** This feature is equivalent to the Rate Validation capability in OFSA 4.5 Rate Manager.

10.5.1 Features of Exchange Rate Validation

The goal of exchange rate validation is to ensure that exchange rates from all active currencies to all reporting currencies are available for processing in the OFSAA applications. Some of these rates can come from the validated direct input, others are calculated based on relationships with other rates. To support triangulation, all fixed exchange rates are available for all currencies that make up an exchange that needs to be triangulated. Also, a direct exchange rate between each Child currency and each reporting currency is calculated and supplied to support quick access to exchange rates. If a Child currency is a Reporting Currency, then Exchange Rates are calculated for all currencies having an exchange relationship with the Parent currency.

10.5.2 Currency Rate Validation

Load currency rates through the Rate Management or using the Historical Rate Data Loader. The initial status is Not Yet Validated.

1. Execute the Currency Rate Validation engine.
2. Navigate to **Operations**, select **Batch Maintenance**, and then click **Create Batch**.

   Component = "Transform Data"

   Rule Name = "Rate_Validation"

   Parameter List (Required) = FROM_DATE and TO_DATE, for example, '20110101', '20110131'

   After completion of the validation process, the status in the Currency Rates window changes to Valid or Invalid (in case there is an issue).
3. View both input and calculated results in the FSI_EXCHNG_RATE_DIRECT_ACCESS table. The OFSAA processing engine reads this table for sourcing historical exchange rates.

> **NOTE** Executing Rate Validation is a required step when a multi-currency setup is enabled. All of the OFSAA processing engines require exchange rates to be validated through this process to convert results from base currency to a selected reporting currency. If exchange rate validation is not run or required exchange rates are not available, the engines will use default exchange rates = 1.

10.5.3 Validating Exchange Rate Relationships

You must run the exchange rate validation process after adding or modifying exchange rate data. Run the process immediately or schedule one or more to be run in the future.

Each exchange rate has one of the following statuses:

- **Not Yet Validated**: The exchange rate has been input or loaded but not yet validated
- **Valid**: The exchange rate has been validated.
- **Invalid**: The exchange rate has violated one or more acceptance rules.

Only exchange rates in Valid status are available for processing and they are not subject to future validation unless you edit them. The Rate Validation status is displayed in the Currency Rates window of the Rate Management.

Exchange Rate Validation Criteria: In the rate validation process, all exchange rate relationships in the database are examined for compliance with the following criteria. Error messages and warnings are displayed if one or more criteria are not met. For more information, see the Viewing Log Messages.

If a currency is defined as a Child in a fixed exchange relationship then it must not be in any floating (standard) exchange rate relationship at the same time. Consequently, all floating exchange rates to or from the Child currency must be defined through the Parent currency. If this criterion is not met then

the following message is displayed: Invalid fixed relationship-Child currency exists in a standard exchange rate within the same period.

- A Child currency within a fixed relationship must not be a Child currency in any other fixed relationship during the same period. If this criterion is not met then the following message is displayed: Invalid fixed relationship-Child currency already exists in a fixed relationship for the same period.
- A circular relationship must not exist. In other words, a Child currency cannot link back to its Parent in any other fixed-rate relationship within the same period. If it does, then the following message is displayed: Invalid fixed relationship creates a circular relationship with other fixed exchange rates.
- Regarding new floating (standard) exchange rates, From and To currencies must not exist as Child currencies within any fixed exchange rate relationships. If this criterion is not met then the following message is displayed: From or To or Both currency or currencies in the new exchange rate already exist in a fixed relationship for the same period.
- If any exchange rate is equal to 0, then a warning message is displayed. 0 is a valid value. You can use it, for example, to designate an exchange rate with a currency of a country that no longer exists.

If two exchange rate relationships fail to meet these criteria then both of them will be labeled Invalid. (Exception, if one of the relationships is already in Valid status, then the other one will be labeled Invalid.) For example, if a currency is defined as a Child in a fixed rate relationship and is also defined as being in a floating relationship at the same time, then both fixed and floating rates for that currency will be labeled Invalid.

If there are both direct and inverse floating exchange rates defined for any two currencies (in other words, one currency is both a To and a From currency in relation to the other), then both relationships will be marked Valid.

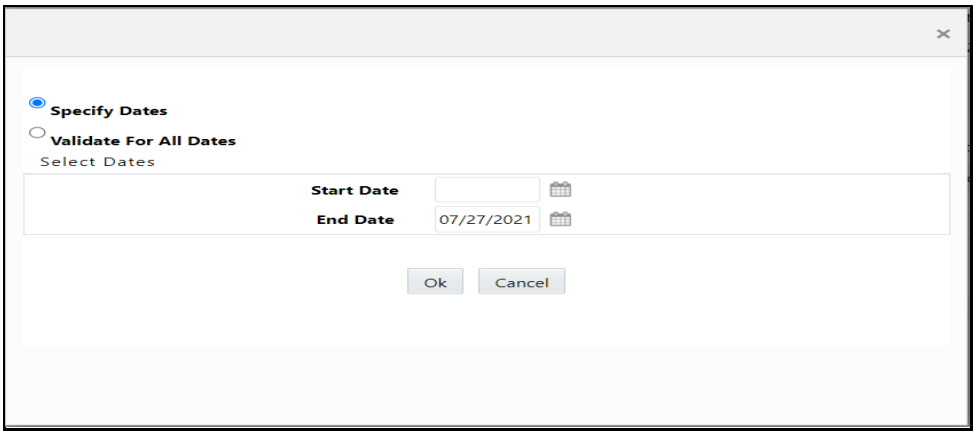
10.5.4 Running an Exchange Rate Validation

You can run a validation immediately or schedule one or more for later. The validation status is displayed in the Currency Rates window of the Rate Management.

10.5.4.1 Running a Validation Immediately

Execute the exchange rate validation using the Currency Rates Validation option.

Figure 68: Currency Rate Validation window



To execute the exchange rate validation, follow these steps:

1. Select a check box on the left-hand side of any row to enable the **Currency Rates Validation** () icon.
2. Click **Currency Rates Validation**.
3. To execute exchange rate validation from the Currency Rates window, the following two options are available:
   - **Specify Dates**: After selecting this option, a Select Dates pane is displayed to enter or verify the FROM_DATE and TO_DATE parameters. These dates will be passed to the batch for execution.
   - **FROM_DATE**: This defaults to the date of last rate validation.
   - **TO_DATE**: This defaults to the current date.
   - **Validate For All Dates**: Select this option to validate all the rates irrespective of dates.

> **NOTE** This option will replace all of the validated exchange rate history and can be a time-consuming process depending on the amount of history available to be processed.

You can execute rate validation using a Simplified Batch or the ICC Batch window. You can also launch it from the Currency Rates UI (Currency Rates Validation toolbar).

To run the validation using the Simplified Batch, follow these steps:

4. Click **Common Object Maintenance**, select **Operations**, and then select **Simplified Batch**, and then click **Add**.
5. From the **Task Details** pane, click **Select Task**. In the **Task Selection** window, choose **Task Type** as **Transform Data**. Click **Search**. In the Task Selector window, select the **Rate_Validation** and click **Ok**.
6. Back in the **Simplified Batch Definition** window, enter the optional parameters to specify the From and To dates, using the format YYYYMMDD, YYYYMMDD.

From_Date and **To_Date** must not be the same value. Set **From_Date** equal to the last rate validation date and **To_Date** to the current date. This will ensure that the Effective To Date for the prior record is set correctly.

7. Click **Save**.
8. In the Simplified Batch Summary page, search for and select your batch, then click **Run**.
9. Click **Yes** to confirm you want to continue, enter a Date and click Ok to continue.

   You will receive a message that it has been successfully launched.
10. Click **Ok**. When the batch is complete, optionally navigate to Operations and select View Log to view the processing log.

    Any error messages or warnings are displayed in View Log. For more information, see Viewing the Messages.

    Simplified Batch does not yet provide access to logs for Transform Data tasks.

    For more information, see the OFS Analytical Applications Infrastructure User Guide.

To run the validation using the ICC Batch Framework, follow these steps:

1. Navigate to **Operations**, select **Batch Maintenance**, and then click **Add** to create a new batch.
2. Search for the above batch, and select it.
3. In the **Task Details** pane (tool-bar), click **Add**. In the **Task Selection** window, choose the **Task Type** as **Transform Data**. Click **Search**. In the **Task Selector**, select the **Rate_Validation** task and click **Ok**.
4. Back in the **Task Definition** window, select the **Rule Name** as **Rate_Validation** and enter the optional parameters to specify the From and To dates, using the format YYYYMMDD, YYYYMMDD.

   From_Date and **To_Date** must not be the same value. Set **From_Date** equal to the last rate validation date and **To_Date** to the current date. This will ensure that the Effective To Date for the prior record is set correctly.
5. Click **Save**.
6. Navigate to Operations, and select **Batch Execution**. Search your batch and select it. Enter Information Date and click **Execute Batch**.
7. Click **Ok**. A message is displayed stating Batch triggered successfully, also displaying the Batch Run ID.
8. Click **Ok**.
9. To view rates, query the database table FSI_EXCHNG_RATE_DIRECT_ACCESS after the run is complete.

   FSI_EXCHNG_RATE_DIRECT_ACCESS: This output table holds the valid currency codes and their exchange rate with respect to the reporting currency for some time say From Date value to optional To Date value. When Exchange Rate Validation runs, if data already exists for the selected date range, the Rate Validation package will overwrite the existing values. If no dates are given, the Rate Validation package truncates this table and re-loads data for the entire historical date range. The following describes the structure of the FSI_EXCHNG_RATE_DIRECT_ACCESS table:

Figure 69: Column details of FSI_EXCHNG_RATE_DIRECT_ACCESS table

Column Name	Nullable	Data Type
FROM_CURRENCY_CD	Not Null	varchar2(15)
TO_CURRENCY_CD	Not Null	varchar2(15)
EFFECTIVE_FROM_DATE	Not Null	Date
EFFECTIVE_TO_DATE	Not Null	Date
EXCHANGE_RATE	Not Null	Number(15,9)
EXCHANGE_RATE_CONVERT_TYPE_CD	Not Null	Number(5)
EXCHANGE_RATE_CONV_FORMULA	Not Null	Number(15)

10. When the batch is complete, navigate to Operations and select View Log to view the processing log. Any error messages or warnings are displayed in View Log. For more information, see Viewing the Messages.

    For more information, see the OFS Analytical Applications Infrastructure User Guide.

10.5.4.2 Scheduling One or More Validations

To schedule a future validation, or to schedule validations on a recurring basis, follow these steps:

1. Navigate to **Operations** and select **Batch Scheduler**. The **Batch Scheduler** window appears.
2. In the **Batch Name** pane, select the **Scheduled Batch ID**. An unchecked box means that no validation is scheduled to run.
3. Select **New Schedule** or **Existing Schedule**.

   The Existing Schedule can be selected only if there are existing schedule batches to view.

   If New Schedule is selected, the New Schedule pane appears. Enter the Scheduled Task Name.

   To schedule the validation on a recurring basis, select Daily, Weekly, Monthly, or Adhoc.
4. In the **Schedule Task** pane, enter the **Start Date** and **End Date** in the Date field.
5. In the **Run Time** field, enter the time for the next validation to be run.
6. Click **Save** to set the schedule as specified or Cancel to drop your changes.

   Any error messages or warnings generated during the validation process are displayed in the View Log. For more information, see Viewing the Messages.

   For more information, see the OFS Analytical Applications Infrastructure User Guide.

10.5.4.3 Viewing the Messages

Any error messages or warnings generated during the exchange rate validation process are displayed in the Log Information window.

To view the messages, follow these steps:

1. Navigate to **Operations** and select **View Log**.
2. Click the **Task ID**. The Log Information window will display.

These exception messages can also be seen in the FSI_MESSAGE_LOG table with the help of the batch_id which was used during execution.

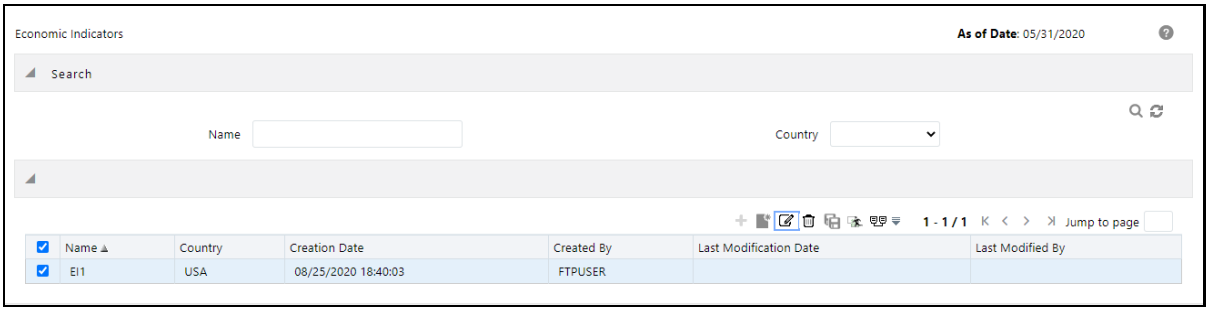
10.6 Economic Indicators Summary Page

An economic indicator is any economic statistic such as the Consumer Price Index (CPI), growth rate of the Gross Domestic Product (GDP), unemployment rate, Purchasing Managers Index, indices of consumer confidence, and so on. Such macroeconomic statistics tell us how well the economy has behaved in the past. Some economic indicators are referred to as lagging indicators while others are classified as leading indicators. Leading indicators can provide insights into the future direction of the economy.

OFSAA Rate Management's Economic Indicators module allows you to define and store such historical indicators. Economic Indicators provide baselines from which OFSAA Asset Liability Management can generate forecasts of future values of economic statistics that can affect new business or other modeling assumptions.

To view the Economic Indicators, navigate to **Common Object Maintenance** and select the **Rate Management**, and then select **Economic Indicators**, an empty window is displayed. After you have defined one or more Economic Indicators, the Economic Indicators Summary page shows all the Economic Indicators that you have previously built.

Figure 70: Economic Indicators Summary page



10.6.1 Searching for Economic Indicator

A **Search** pane is provided in which you can search for Economic Indicators by **Name** or **Country**. Each Economic Indicators rule is specific to one country.

To search the Economic Indicator, follow these steps:

1. Enter search criteria and click the **Search** icon.
2. Click the **Reset** icon to remove any Name or Country search criteria and refreshes the window.

   The search results are displayed in a tabular format containing all of the Economic Indicators that meet search criteria. The Economic Indicators Summary page offers several icons to perform different functions when an Economic Indicator is selected.

   - **Add**: Click Add to begin the process of building a new Economic Indicator. The Add icon is disabled if any rows in the pane are selected.

- **View**: Select a single row out of the pane to enable the View. Click the View icon to view the contents of an Economic Indicator on a read-only basis. The View icon is only enabled when a row is selected.
- **Edit**: Select a single row out of the pane to enable the Edit. Click the Edit icon allows you to modify a previously saved Economic Indicator. The Edit icon is only enabled when a single row is selected.
- **Delete**: Select one or more rows out of the pane to enable the Delete. Clicking on the Delete deletes the Economic Indicators you have selected.
- **Copy**: Select a single row out of the pane to enable the Copy. Click the Copy icon to create a copy of an existing economic indicator. The Copy icon is only enabled when a single economic indicator is selected.
- **Check Dependencies**: Select an Economic Indicator and then click the Check Dependencies icon to generate a report on all rules that utilize your selected economic indicator.

  The Check Dependencies is only enabled when a single economic indicator is selected.
- **Data Loader**: The Data Loader option executes a function to import historical economic indices for all defined Economic Indicators. For more information on setting up the automated process, see the OFS Data Model Utilities User Guide.

  To execute a data load, click on the **Data Loader**.

  A warning message will appear Upload all available Economic Indicators? Click Ok, and all historical indices will be loaded.

To select an Economic Indicator, select a check box in the first column of the pane. More than one Economic Indicators can be selected at a time but this will cause some of the icons to become disabled.

Select or deselect all of the Economic Indicators in the Economic Indicators Summary page by selecting the check box in the upper left-hand corner of the Summary page directly to the left of the Name column header.

The following columns categorize each Economic Indicator on the Summary page:

- **Name**: Displays the Economic Indicator's short name. Performing a mouse-over on a row within the pane displays the Economic Indicator's detailed description.
- **Country**: Displays the Country to which an Economic Indicator applies.
- **Creation Date**: Displays the Date and Time at which an Economic Indicator was created.
- **Created By**: Displays the Name of the user who created an Economic Indicator.
- **Last Modification Date**: Displays the Date and Time at which an Economic Indicator was last modified.
- **Modified By**: Displays the Name of the user who last modified an Economic Indicator.

10.6.2 Economic Indicators Details

When you **Add**, **Edit**, or **View** an Economic Indicator, the **Economic Indicator Details** window is displayed. The **Economic Indicator Detail** window includes an **Economic Indicator Details** pane, the **Economic Indicators - Historical Data** pane, and an **Audit Trail** pane.

The **Audit Trail** pane is a standard footer pane for every OFSAA rule type. The **Audit Trail** pane displays Created By, Creation Date, Last Modified By, and Modification Date. The **User Comments** tab can be used to add comments to any rule, subject to a maximum of 4000 characters.

10.6.3 Adding an Economic Indicator

To add an Economic Indicator, follow these steps:

1. Click Add from the Economic Indicator Summary page.

Figure 71: Adding a new Economic Indicator

2. Enter the following information in the Economic Indicator Details window as tabulated.
   - **Name**: The name of your Economic Indicator is how you will subsequently refer to your rule within the OFS Analytical Applications. You cannot rename existing Economic Indicators.
   - **Frequency**: The frequency of your Economic Indicator must match the frequency with which the indicator's data is made public. Unemployment statistics, for example, are normally released on a monthly frequency. Select a frequency from the **Frequency** drop-down list. Available frequencies are **Weekly**, **Monthly**, **Quarterly**, **Semi-Annually**, and **Annually**.
   - **Value Type**: Select a Value Type from the **Value Type** drop-down list. Available Value Types are Numeric, Percentage, and Amount.
     - Numeric: 0-999999
     - Percentage: -100 to +100
     - Amount: 0-999999
   - **Country**: Select a country to which your Economic Indicator applies from the Country drop-down list. The value set of Countries is drawn from the seeded Country dimension. OFSAA is seeded with over 70 country values, and you can add user-defined countries.
3. Click **Save**. To build out your historical data, enter data within the **Economic Indicators - Historical Data** pane.

   The Economic Indicators - Historical Data pane displays a single blank row followed by the most recent period's data (if data has previously been stored in the database).

Figure 72: Economic Indicators - Historical Data section on Economic Indicator window

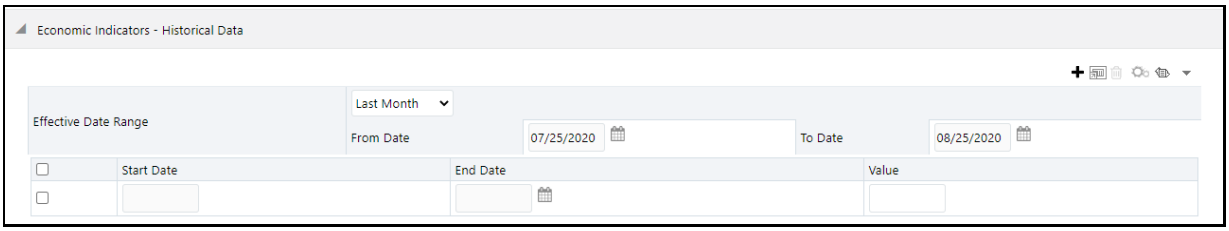


Figure 73: Economic Indicators - Historical Data section - Fields and Descriptions

Fields	Description
Start Date and End Date	Select the **Calendar** icon immediately adjacent to the End Date to choose an ending date for your Economic Indicator data point. The application will automatically populate the Start Date based on the Economic Indicator's frequency. For example, if your Economic Indicator is an unemployment statistic that has a monthly frequency, select an end date that is the last day of the month that the unemployment rate describes. In this example, the application will automatically populate the Start Date with the first day of the month you have selected.
Value	Enter the value for your Economic Indicator (such as the unemployment rate).
Adding Multiple Data Points	Click **Add** to add additional blank rows into which you can enter additional Economic Indicator data. When you have finished adding data, click Save.
Editing Economic Indicators - Historical Data	Select a single check box on the left-hand side of any row to enable the Edit. Clicking **Edit** to become the row active. You can edit this row and subsequently save the changes.
Viewing Economic Indicators - Historical Data	By default, the Economic Indicators - Historical Data pane displays the most recent month of historical data. You can restrict the amount of data displayed by selecting a different value from the **Effective Date Range** drop-down list. You can also choose to view a specific date range by modifying the **From Date**, **To Date**, or both dates within the **Economic Indicators - Historical Data** pane.
Deleting Economic Indicators - Historical Data	Select one or more check boxes on the left-hand side of any row to enable the **Delete** icon. After clicking Delete, a confirmation message is displayed to delete the selected rows.
Data Loader	The Data Loader option executes a function to import historical economic indicators for all defined economic indicators. For more information on setting up the automated process, see the OFS Data Model Utilities User Guide. To execute a data load, click the Data Loader. A warning message will appear *Upload all available Economic Indicators?* Click **Data Loader** to execute all the Economic Indicators.
Excel Import and Export	Use Excel Import or Export functionality to add or edit Historical Economic Indicators.

11 Holiday Calendar

This chapter discusses the procedure to create a Holiday Calendar and generate a list of the weekend and holiday dates. Individual applications may consume the Holiday Calendar events in different ways. For more information, see the application-specific User Guides and the OFS Cash Flow Engine Reference Guide.

Topics:

11.1 Overview of Holiday Calendars

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

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

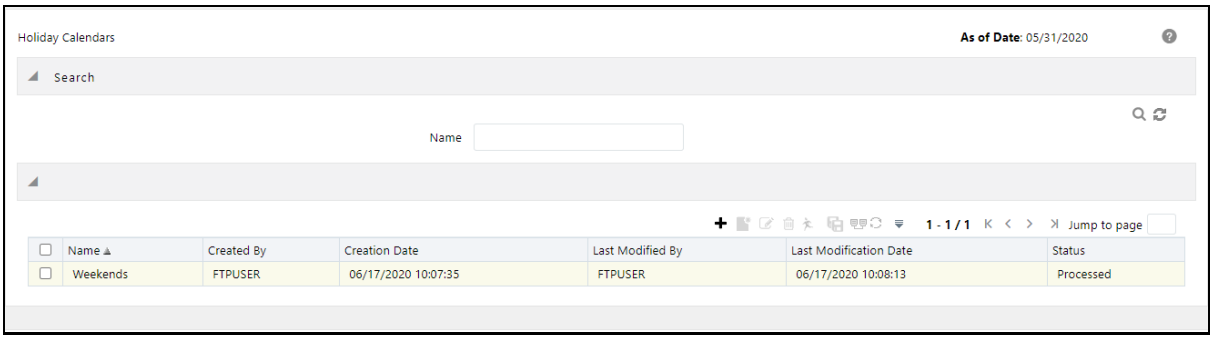
- Searching for a Holiday Calendar.
- Viewing and Updating a Holiday Calendar.
- Copying a Holiday Calendar.
- Deleting a Holiday Calendar.
- Check Dependencies in the Holiday Calendar definitions.
- Refresh the Holiday Calendar summary page.

11.2 Searching for a Holiday Calendar

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

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

Figure 74: Holiday Calendars



You must have created a Holiday calendar to be able to search for Holiday Calendar rules.

To search for a new Holiday Calendar rule, follow these steps:

4. From the LHS menu, select **Common Object Maintenance**, and then select **Holiday Calendar** to display the **Holiday Calendars** Summary page. This page holds all Holiday Calendars and related functionality. You can navigate to other pages relating to the Holiday Calendar from this page.
5. Enter the name of the Holiday Calendar and click **Search**.

   Only Holiday Calendars that match the search criteria are displayed.

> **NOTE** You can control the number of rows to display on the screen by selecting the Pagination icons from the action bar.

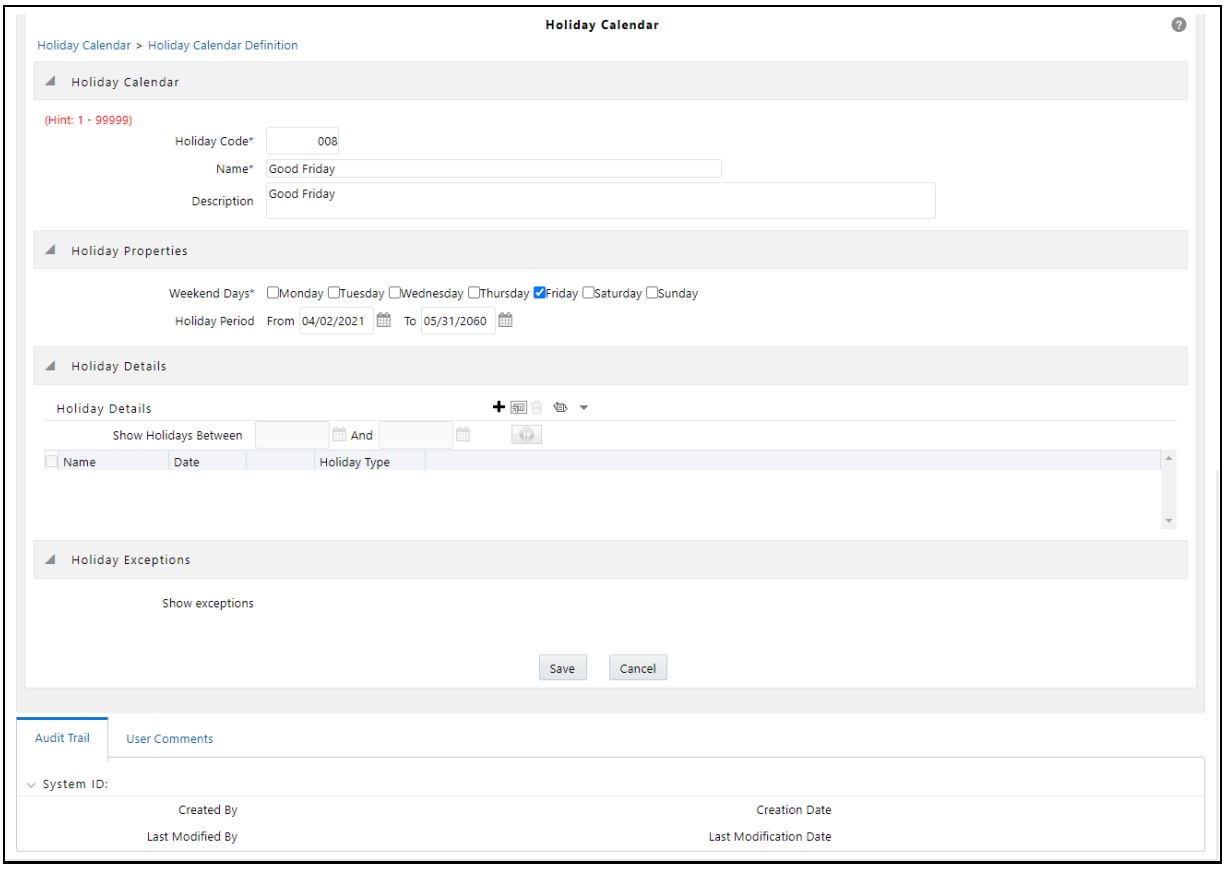
11.3 Creating a Holiday Calendar

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

To create a new Holiday Calendar rule, follow these steps:

1. From the LHS menu, select **Common Object Maintenance**, and then select **Holiday Calendar** to display the **Holiday Calendars** summary page.
2. Click the **Add** icon. The Holiday Calendar Details page is displayed.

Figure 75: Holiday Calendar Definition



3. Enter a code value for the new Holiday Calendar.
4. The code is a numeric identifier for the Holiday Calendar. The code value must be a number between 1 and 99999. The code value you assign to the new Holiday Calendar must be unique.
5. Enter the name and a brief description for the Holiday Calendar.
6. The name you assign to the Holiday Calendar must be unique. The name can hold a maximum of 30 characters.
7. In the Holiday Properties grid, select not more than two weekend days. Then choose the Holiday Period. The Holiday Period can be defined for a range of up to 40 years less than the current date and 40 years greater than the current date, totally spanning a maximum of 80 years.
8. In the Holiday Details grid, define the Holiday details for any period within the holiday range defined in step 6. Two types of holidays can be defined: Fixed and Moving.
9. A fixed holiday is deemed as a holiday for every year in the holiday period, for that particular day.

   Example

   25th December – Christmas, is a fixed holiday.

NOTE

To define a fixed holiday, input the holiday date for the first occurrence in the date range. For example, if your Date Range runs from 01-JAN-2000 to 31-DEC-2050, you should input the fixed holiday, Christmas, as 25-DEC-2000. The Holiday Calendar procedure will populate all subsequent 25-DEC entries in the holiday list table (FSI_HOLIDAY_LIST). A HOLIDAY_TYPE code = 0 is a Fixed type holiday, code = 1 is a Moving type holiday, and code = 2 is a weekend.

The Holiday Calendar procedure will also ensure that holiday and weekend entries are not duplicated. For example, if weekends are defined as Saturday/Sunday and Christmas falls on a weekend day, there will be only one entry in the FSI_HOLIDAY_LIST table. The PREVIOUS_WORKINGDAY and NEXT_WORKINGDAY fields designate the valid prior and following working days, respectively. A moving holiday is deemed as a holiday only for that particular date and year, and not for every year in the holiday period. All occurrences of a moving holiday must be input manually.

For example, 10th April 2020 is a moving holiday for Good Friday.

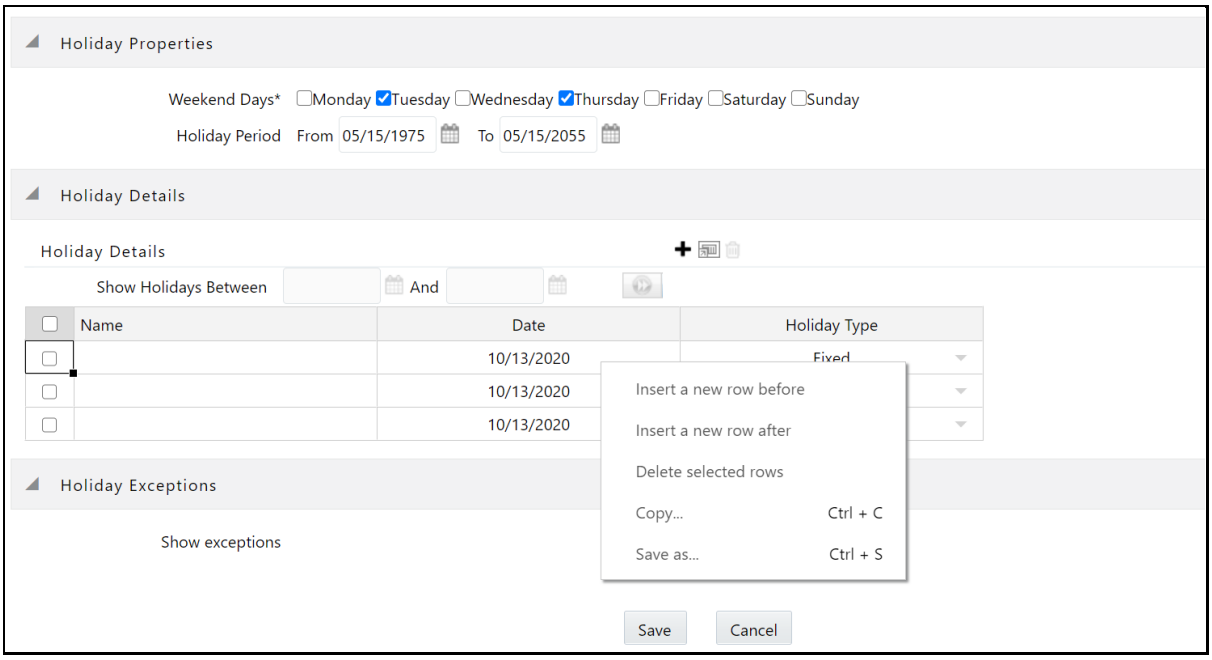
10. Once the Holiday Calendar definition is saved, its status in the Holiday Calendar Summary page is marked as defined.
11. A Holiday Calendar created can also be deleted. Select one or more check boxes of Holiday Calendar definitions and click Delete.

11.3.1 Excel Compatibility

This functionality is used for inserting Holiday Calendar definitions from an Excel sheet. You can right-click on any cell in the table and perform the following actions:

- Delete or Insert multiple rows
- Apply a Formula on a particular column
- Export the data to an Excel sheet using the **Save As** option.
- You can copy data from an Excel sheet and paste the same using standard copy, paste shortcuts Ctrl+C and Ctrl+V.

Figure 76: Holiday Properties Page



11.4 Executing Holiday Calendar

Execute a Holiday Calendar definition to generate calendar dates listing the various types of holidays for a given holiday period.

Prerequisites

Predefined Rules

To execute the Holiday Calendar, follow these steps:

1. Navigate to the Holiday Calendar Summary page.
2. Search for a rule.
3. Select a Holiday Calendar and Click the Generate Calendar Dates icon to execute the selected Holiday Calendar. Holiday list for holiday ID #1 generated successfully message appears (where #1 is the Holiday Calendar code). The holiday list can be confirmed by querying the FSI_HOLIDAY_LIST table.
4. The status of a Holiday Calendar where holiday dates are generated displays as Processed in the status column on the summary page.

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

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

11.5 Holiday Exceptions

You can specify exceptions to the holidays. As a prerequisite, a Holiday Calendar must be properly defined and the status of the Holiday Calendar in the summary page must be processed. Generating the holiday list will populate the holidays (weekends, fixed, and moving) along with the working days. Then the Show Exceptions button is enabled on the detail page. Any changes in the holiday definition will disable the "Show Exceptions" button. The user must generate the holiday list again to define or view the exceptions.

1. Click Show Exceptions in the Holiday Exceptions pane. The Holiday Exceptions window opens.
2. The search block in the Exceptions page has the following fields:
   - **From and To**: Denotes the range of years which is a subset out of the holiday list generated, for which exceptions are required to be defined.
   - **Fixed Holidays**: You can filter the list of holidays by the type of Fixed Holidays.
   - **Moving Holidays**: You can filter the list of holidays by the type of Moving Holidays.
   - **Holiday Date**: For a particular known holiday date, exceptions can be defined.
   - **All Exceptions**: This check box when selected lists all the exceptions, if already defined, for the holidays within the From, To Date range.
3. The search result gives the list of all holidays based on the selection of the above search criteria fields.
4. In the Holiday Exceptions pane, there are two types of exceptions that can be defined: Not a holiday and Shift to.
5. Any holiday can be marked as not a holiday, in which case that day is removed from the Holiday List. If you select Not a Holiday from the Exception Type drop-down, then the Shift to date field is disabled.
6. Spring earlier considered as a holiday in the Holiday Calendar can be marked as Not a Holiday in the Holiday Exceptions window. You can write your comments or remarks in the Notes next to the Exception Type drop-down list.
7. Any holiday can be shifted to another day, in which case the earlier declared holiday is removed from the Holiday List, while the shifted day is included as a holiday.

12 Oracle Balance Sheet Planning Process

This module describes the steps that you need to follow to define and execute the end-to-end Balance Sheet Planning Process.

Oracle Balance Sheet Planning is based on the Oracle Financial Services Analytical Applications Infrastructure (OFSAAI). OFSAAI is the central, integrated data source and Administration layer on which Oracle Financial Services Analytical Applications (OFSAA) are built. This description of the Oracle Balance Sheet Planning Process assumes that your system administrator has set up the OFSAAI data repository and has populated it with your enterprise-wide business data.

This chapter covers the following topics:

12.1 Overview of the Process

Oracle Financial Services Balance Sheet Planning (OFS BSP) is designed to model balance sheets under a variety of rate environments. OFS BSP functionality uses several key concepts and has

evolved from the continual iterations of building simulated management processes. The basis of OFS BSP functionality includes:

- The ability to model account-level detail to precisely capture the complex product characteristics within a financial institution's portfolios.
- A flexible time horizon is critical to meeting the wide range of forecasting requirements of financial institutions.
- Unconstrained chart of accounts definition is a basic requirement of effective modeling.
- A structured process for defining and controlling assumptions is critical to any successful modeling process.

12.1.1 Key Operational Concepts

OFS BSP includes six key modeling attributes:

- Modeling Using Account-Level Data
- Separation of Data from Assumptions
- Separation of Assumptions Types
- A Structured Approach to Defining Rate Scenarios
- Flexible Chart of Accounts
- Powerful Assumption IDs

12.1.2 Modeling Using Account-Level Data

OFS BSP models data at an account level (loan-by-loan and deposit-by deposit). In this way, cash flows are precisely modeled based on the unique characteristics of each loan and deposit.

12.1.3 Separation of Different Types of Assumptions

By separating data from modeling assumptions, you can modify assumptions and then run a reprocessing procedure without affecting data. In addition to the instrument data being separate from assumptions, each type of assumption is defined independently from other assumption types. Although they act dynamically during a processing run, assumptions about new business characteristics, new business volume, new business pricing, new business maturity mixes, and prepayments are defined independently. This facilitates the isolation of the impact of a change on one assumption.

12.1.4 Structured Approach to Defining Rate Scenarios

Structured testing of alternative rate environments is a key to a strong “what-if” analysis process. The model provides numerous utilities for defining and quality controlling rate scenarios. Because rate scenario modeling assumptions can be saved as patterns in Forecast Rate Scenario rules, the typical burden of quality controlling rate scenarios is dramatically reduced. Once a pattern of rate shocks, spread changes, or yield curve rotations (or combination of the above) is defined, it can be saved as a Forecast Rate assumption rule to be used again and again. When data are updated in the model, all you need to do is update the base position of key market rates. The change pattern in an assumption

rule can be applied and the forecast rate assumptions are automatically updated. It can also easily be cloned and modified to be saved as another Forecast Rate assumption rule. This approach for defining rate scenarios is ideally suited for testing numerous rate environments in a controlled fashion.

12.1.5 Flexible Chart of Accounts

You can define an unlimited chart of accounts (Dimension Member Values), incorporating all of the key elements which drive cash flow generation.

12.1.6 The Power of Assumption Rules

You can mix and match any set of combinations of assumptions: forecast rate scenarios, pricing margins, maturity mix strategies, prepayments, product characteristics, and so on. The separation of each element of the scenario assumptions means that you can incrementally modify one piece of the modeling equation and easily test its effect.

12.1.7 How the Model Works

While the specific operation of each section of the model is addressed separately in this guide, a general description of the modeling logic includes the following premises:

- The current position data defines the existing base of transactions
- New business volumes are generated within OFS BSP's planning user interfaces
- The maturity mix of new volumes is defined by assumptions
- Pricing of new volumes and repricing of existing volumes are defined by rate scenario assumptions and the contractual pricing characteristics of individual transactions
- Dynamic prepayment assumptions can be applied to any account
- Cash flows are determined through the integration of data and assumptions
- Assumptions can be flexibly combined

12.1.8 Current Position Data

OFS BSP forecasts are based on modeling the behavior of existing transactions, as well as those that originate in future periods. The complete cash flow characteristics of each existing transaction are defined in the data structure that is imported into the OFSAA data model on a loan-by-loan and deposit-by-deposit basis.

> **NOTE** A System Administrator is responsible for producing a current position forecast that is subsequently used by Planning Administrators and Planning Users within BSP's planning user interfaces.

12.1.9 New Business Volumes

New Add volumes in each period are defined on the basis of a forecast of new incremental volume for each account or calculated on the basis of achieving a “target balance” in the account. The cash flow characteristics of newly originated volumes are determined by the Product Characteristics definitions. New volume assumptions apply to non-interest income and expense accounts as well.

> **NOTE** All New Business volumes are generated by planning users within BSP's planning user interfaces.

12.1.10 The Maturity Mix of New Volumes

The maturity mix of forecasted volumes originated for an account is determined by assumptions that are applied to each element of the account.

> **NOTE** In BSP, Maturity Mix data is applied to New Business volumes generated within BSP’s planning user interfaces.

12.1.11 Pricing of New Volumes and Repricing

Pricing of newly originated volumes, or repricing of adjustable and variable rate volumes, is determined by the integration of several factors. Each existing or newly originated transaction is linked to a single rate (a market rate) or a yield curve. The actual rate determined at origination or repricing takes into account the prevailing single rate or yield curve. The term of the transaction (if pricing is tied to a yield curve) is also taken into account, as well as other pricing characteristics (margin, life cap, period cap, and so on.). Incremental pricing margins can be applied to new originations on a period-by-period basis for each account.

> **NOTE** All New Business pricing is generated by planning users within BSP's planning user interfaces.

12.1.12 Dynamic Prepayment Assumptions

You can apply dynamic prepayment assumptions to any account. Prepayments are applied on a loan-by-loan basis. Prepayment assumptions use individual instruments characteristics to drive prepayment behavior.

12.1.13 Cash Flows

Cash flows for every instrument are calculated in every modeling period according to the contractual terms defined in the incoming data and/or product characteristics definitions, combined with interest

rate scenario and prepayment assumptions. Principal and interest cash flows are recalculated as contractually defined.

12.1.14 Batching Assumptions

Financial forecasts are built through the integration of current position data with each of the modeling scenario assumption elements:

- Current Position Data (account-level data)
- Forecast Rate Scenario Assumptions
- Forecast Balance Assumptions (collected in Planning interfaces)
- Maturity Mix Strategies
- Pricing Margin Assumptions (collected in Planning interfaces)
- Prepayment Assumptions
- Product Characteristics Assumptions

12.1.15 Flow of the Modeling Process

The organization of the OFS BSP menu structure is better understood in the context of the general flow of the modeling process, as follows:

1. Set up Application Preferences, including:
   - Certain elements of Application Preferences (as of date for data, modeling leaves, and so on)
   - Default values and limit details
2. Load transaction-level data.
   - Load data into the system for modeling.
3. Perform cash flow edits.

   Each of the individual instrument records must be quality controlled. For each instrument record, the cash flow edits check all of the columns used in cash flow calculations for internal consistency. For example, the maturity date must be greater than the origination date, and the payment frequency must be greater than zero. This process is available within BSP Processing and is a critical step in ensuring that OFS BSP produces expected results.
4. Define modeling assumptions.

   Define assumption sets. These include any number of the assumptions described in this module and will minimally include Time Buckets, Product Characteristics, and Forecast Rate Scenarios.
5. Specify the model run. Select a combination of assumption sets that will be applied to the data you wish to model. You may define a single processing run, or a batch of several runs, including multiple sets of assumptions. The run or batch is launched and results are produced into results tables.

12.2 Reconciling the Data

Reconciliation is the process of comparing the information carried in the Instrument tables to the general ledger balances (contained in Ledger Stat).

The goal of the Balance Sheet Planning Process is to measure and manage interest rate and liquidity risk for the entire balance sheet, as represented on the general ledger. Many ledger accounts have corresponding data in the Instrument tables. In such instances, the balances from the instrument data must be compared with the corresponding ledger balances.

The reconciliation process involves defining a level at which some piece of information in the Instrument tables is to be compared to the General Ledger data carried in the Management Ledger (also known as LEDGER_STAT). That level can be one dimension (to reconcile for each general ledger account number, for example, General Ledger Account ID) or multiple dimensions (to reconcile for each general ledger account number within each business unit, for example, General Ledger Account and Organization Unit).

The most common type of reconciliation is to compare the current balance of Instrument table data to the general ledger ending balance. The data carried in the database is a snapshot of the portfolio as of a given date. Consequently, comparing the current balances from the Instrument table to the general ledger ending balance measures the degree to which the extracted data is in balance with, or reconciles to, the general ledger.

Variances between the Instrument table and the Management Ledger table should be corrected. If the magnitude of the variances is within an acceptable tolerance, plug entries should be created to force the reconciliation to zero. An Instrument table (FSI_D_LEDGER_STAT_INSTRUMENT) has been seeded in the database to hold these plug balances and any Ledger Specific balances that you wish to include as instrument balances for BSP processing.

12.3 Cleansing the Data by performing Cash Flow Edits

The data in the Instrument tables must be clean, accurate, and complete before it is used to generate cash flows and for further processing. Oracle BSP provides seeded Cash Flow Edit rules to edit (clean and prepare) Instrument table data. You can create multiple Cash Flow Edit Processes depending on the data to be cleansed. In addition, you can view actual results of Cash Flow Edits by accessing the audit data written into the FSI_PROCESS_ERRORS table.

You can also select the preview mode option so that you can preview the changes that will be made to the Instrument table data as a result of cash flow edits before those changes are applied in the Instrument tables.

It is highly recommended that you create and run Cash Flow Edits before processing data to generate any type of cash flow-related results. See: Cash Flow Edits

12.4 Setting Application Preferences

Application Preferences allow users to set the current As of Date and configure default values used throughout the application.

12.5 Activating Currencies and Loading Exchange Rates

Rate Management under “Common Object Maintenance” handles all currency definitions for OFSAA applications. Currencies are conveniently referred to by code and written description. A comprehensive list of ISO-defined currencies is included, and you can define and add your own. Upon installation, one currency is active and ready for processing: the one identified by your organization as the functional currency. You can activate other currencies and define and activate newly-created currencies when needed. In addition, you can designate key currencies to be used for reporting. These alone will be available for cross-currency consolidation.

The Common Object Maintenance> Rate Management > Currencies screen enables you to select currencies for reporting and for establishing interest rates and exchange rates. It allows you to activate relevant currencies and classify them as:

- Functional Currency
- Reporting Currencies
- Other Active Currencies

Before defining the classifications, let's begin by discussing two types of currencies: ISO-defined and user-defined.

12.5.1 Currency Definitions and Classifications

OFSAA Rate Management provides a list of ISO-defined currencies for you to activate as needed. (The functional currency is activated upon installation). You can also define and add your own. Any currency except the functional currency can be deactivated or deleted.

Currencies are displayed in alphabetical order by currency code.

12.5.2 The Functional Currency

At the time of installation, Rate Management requires the installer to designate a functional, or primary currency for the organization (stored in the FSI_DB_INFO table). A German multinational bank would therefore designate the Euro as its functional currency. Only one functional currency is allowed per organization, and once assigned it cannot be changed. The functional currency is both an active and a reporting currency.

12.5.3 Reporting Currencies

A reporting currency is an active currency that balances in other currencies is consolidated, to facilitate reporting. Balances in reporting currencies are, in turn, consolidated to the functional currency. For example, an American multinational bank might consolidate its holdings in Asian currencies to the Japanese Yen and its balances in European currencies to the Euro. Then it would consolidate the sums to the U.S. dollar.

12.5.4 Other Active Currencies

An active currency is any currency the organization works with. When OFSAA is installed only the functional currency is active and available for processing. If your institution has holdings in more than

one currency then you need to activate those currencies. A Mexican bank doing business in the United States and Canada, for instance, would activate the U.S. dollar and the Canadian dollar.

For more information on loading exchange rate data using the staging area and the related data loader utility, see Oracle Financial Services Analytical Applications Data Model Utilities User Guide, Stage History Rates Loader module.

For more information on loading exchange rate data using the Currency Rates user interface, see Currency Rates.

12.6 (Mandatory) Deciding on historical rate information and managing by creating Interest Rate Codes

The quality and availability of interest rate information vary throughout the world. In many markets, gathering comprehensive rate information is a challenge because of insufficient security types, inconsistent quoting conventions, and lack of liquidity.

OFSAA Rate Management facilitates the process of inputting and viewing interest rates and yields by supporting multiple rate formats and other rate attributes to give you data storage capabilities appropriate to your market. For example, you can store the following data attributes for each interest curve:

- Rate format (zero-coupon or yield-to-maturity)
- Accrual basis
- Compound basis

Term structure parameters provide insight into the stability and direction of future rates. Rate Management enables you to define and store—up to daily—term structure parameters for any and all currently supported term structure models.

When you add an Interest Rate Code, the Add/Edit page appears with four tabbed pages. The pages display interest rate code characteristics and enable you to define, input, modify, and view data. The tabs are Attributes, Terms, Rates, and Parameters. You can only define interest rates where you have an active currency. See Rate Management.

For more information on loading interest rate data using the staging area and the related data loader utility, see Oracle Financial Services Analytical Applications Data Model Utilities User Guide, Stage History Rates Loader module.

12.7 Capturing Instrument Behavior for non-standard instruments

This section covers the following sub-sections:

- Capturing Instrument Behavior for Non-Standard Instruments
- Defining Behavior Patterns
- Defining Payment Patterns
- Defining Repricing Patterns
- Loading Payment Schedule Details

12.7.1 Capturing Instrument Behavior for Non-Standard Instruments

Payment and repricing characteristics for most instruments can be accommodated through the data attribute values in the Instrument tables. However, certain instruments may not have contractual cash flows or may have cash flows that are based on unique payment and repricing patterns that are too complex to be accommodated in the standard fields of the Instrument tables. Oracle Balance Sheet Planning allows you to define custom behavior, payment, and repricing patterns to accurately model the unique characteristics for such instruments.

12.7.2 Defining Behavior Patterns

In user-defined Behavior patterns, you can assign a unique amortization type code to a set of payment tenors, and define principal cash flow amounts (via percentages) for the following instrument types:

- Non-maturity Instruments
- Non Performing Instruments
- Devolvement and Recovery of Guarantees

Once you create a behavior pattern, you can use it by mapping the unique behavior pattern code as the amortization type code for your instruments. Behavior pattern codes are defined within a pre-set range (70000 – 99999). When the cash flow engine encounters an instrument with an amortization type code within this pre-determined range, it understands that a Behavior Pattern should be referenced for determining the principal cash flow amounts.

12.7.2.1 CFE Requirements and Functionality

AMRT_TYPE_CD of the instrument table should contain the behavior pattern code.

Non Performing Assets

Behavior Sub Type = Substandard, Doubtful, and Loss (from Behavior Pattern).

BEHAVIOR_SUB_TYPE_CD can be NULL when BEHAVIOR_TYPE_CD = 1 (Non-Maturity). When BEHAVIOR_TYPE_CD = 2 (Non-Performing), then value is expected in BEHAVIOR_SUB_TYPE_CD. All the Substandard, Doubtful, and Loss events of Behavior Pattern will be processed by the CFE. Any outstanding balance after all the Non Performing events from the pattern definition are processed will be written off on the maturity date. No interest cash flows will be generated.

Next Payment Date: This will need to be after As of Date of the process run. Suggested to be the same as Maturity Date since no interest payment is expected to happen.

Maturity Date: This will need to be after As of Date of the process run. Write off event will happen on the maturity date.

Compounding Basis, Accrual Basis, Remaining Number of Payments, Current Payments, Current Net Rate, Adjustable Type Code: Since the interest cash flow will not be generated, these can be the default values. Interest cash flow is output for Earning Assets, Interest bearing Liabilities, Interest Income, and Interest Expense account types.

12.7.2.2 Non Maturity

Behavior Sub Type = Core and Volatile (from Behavior Pattern).

Instrument records need not contain behavior sub-type. The engine will generate the core runoffs and volatile runoffs based on the pattern definition. Interest cash flow is paid out on the payment dates.

Original Term, Amortization Term, Maturity Date: Engine arrives at Maturity Date based on the highest tenor given in the pattern definition. It is suggested that the Original Term and Amortization term be assigned 99 years for non-maturity accounts. If the engine calculated maturity date is less than the maturity date in the instrument record (as normally is the case), then the instrument matures on the calculated maturity date, and the remaining interest is paid out on the calculated maturity date (interest in arrears case). The maturity date is calculated by the engine by adding the longest non-maturity tenor to as of date.

12.7.2.3 Devolvement and Recovery

Behavior Sub Type = Sight Devolvement, Sight Recovery, Usance Devolvement, and Usance Recovery (from Behavior Pattern).

Instrument data should contain the behavior subtype as Sight (Code: 306) or Usance (Code: 305). The sub-type code is used by the engine to generate the devolvement or recovery events.

- If sub-type =Sight and Devolvement Status is “No” (both from the instrument record), then all the Sight Devolvement events from the Behavior Pattern will be processed. Finally, all the Sight Recovery Events will be processed.
- If subtype = Sight and Devolvement Status is “Yes” (both from the instrument record), then all the Sight Recovery events available in the Behavior Pattern will be processed.

Any unrecovered balances will be written off on the maturity date. Similarly, Usance events will be processed.

One Behavior pattern can contain a mix of Sight and Usance events but the Engine will process the events based on the Behavior Type Code of the instrument. No interest cash flows will be generated.

Next Payment Date: This will need to be after As of Date of the process run. Suggested to be the same as Maturity Date since no interest payment is expected to happen.

Maturity Date: This will need to be after As of Date of the process run. Any outstanding balance after all the Recovery events from the pattern definition are processed will be written off on the maturity date.

Compounding Basis, Accrual Basis, Remaining Number of Payments, Current Payments, Current Net Rate, Adjustable Type Code: Since the interest cash flow will not be generated, these can be the default values.

12.7.2.4 Behavior Pattern Structure

Oracle Balance Sheet Planning allows you to build three types of behavior patterns:

- Non Maturity
- Non Performing
- Devolvement and Recovery

These behavior patterns differ in terms of how they allow you to categorize cash flows based on the specific behavior type being modeled. The following table summarizes the various payment types available for each type of behavior pattern.

Table 2: Payment Types available for each type of Behavior Pattern

Pattern Type	Payment Type
Non Maturity	Volatile
	Core
Non Performing	Sub Standard
	Doubtful
	Loss
Devolvement and Recovery	Sight Devolvement
	Sight Recovery
	Usance Devolvement
	Usance Recovery

12.7.2.5 Payment Events

You must define one or more payment events to complete a behavior pattern. A payment event is a set of payment characteristics, which define the timeline and amount of a specific payment in the behavior pattern. While the payment types can change based on the pattern type selected, three inputs are required for all behavior patterns:

- Term
- Amount
- Type

12.7.2.6 Principal Runoff Term

The Term of the principal runoff is determined by the input of a Tenor and Multiplier. For example, if you are defining the “Volatile” component of a non-maturity instrument, you would likely define the runoff term for the first amount as “1 Day”. In this case, Tenor = “1” and Multiplier = “Day”

Amount

The cash flow amount is defined as a percentage of the end-of-period balance. For example, in the case of the Non-Maturity behavior pattern type, if the assumption for the Volatile runoff amount is that 25% of the portfolio is to be categorized as "volatile", the input should be "25". The sum of the percentages for the Non-Maturity behavior pattern type must equal 100%. The "Total Percentage" is shown at the bottom of the Pattern detail area indicating the cumulative percentage.

12.7.2.7 Payment Type

The payment type selection categorizes all payment runoff into meaningful groupings. The principal runoff type is carried forward by the cash flow engine and can be identified in the cash flow results by the following financial element codes.

- 186 Writeoff Positive
- 187 Timing of Writeoff Positive
- 188 Writeoff Negative
- 189 Timing of Writeoff Negative
- 200 Non Maturity - Core Runoff
- 201 Timing of Non Maturity - Core Runoff
- 202 Non Maturity - Volatile Runoff
- 203 Timing of Non Maturity - Volatile Runoff
- 204 Devolvement Runoff
- 205 Timing of Devolvement Runoff
- 206 Recovery Runoff
- 207 Timing of Recovery Runoff
- 208 Non-Performing Asset Runoff
- 209 Timing of Non-Performing Asset Runoff

12.7.3 Defining Payment Patterns

In a user-defined payment pattern, you can assign a unique amortization type code to a set of payment events, which may include some of the following customized features:

- Changes in payment frequency
- Seasonal payment dates
- Nonstandard or variable payment amounts

Once you create a payment pattern, you can use it by entering the payment pattern code as the amortization type code for the instrument.

12.7.3.1 Payment Pattern Structure

Oracle Balance Sheet Planning allows you to build three types of payment patterns:

- Absolute
- Relative
- Split

These payment patterns differ in terms of how they address payment schedules, which determine whether the payment events constituting the pattern are determined by calendar dates or periods.

Absolute patterns are defined with sets of payment characteristics scheduled on specific calendar dates. Relative patterns are defined with sets of payment characteristics scheduled for certain periods.

You can also define a payment pattern with both absolute and relative payment events. This type of pattern is called a split pattern.

In addition, for each payment pattern, you need to specify a payment type, either conventional, level principal, or non-amortizing. Your choice of the pattern type and the payment types will determine the fields that are used for calculation.

12.7.3.2 Payment Events

You must define one or more payment events to complete a payment pattern. A payment event is a set of payment characteristics, which define the timeline and amount of a specific payment in the payment pattern.

Though the characteristics of the payment phase change based on whether you are defining an absolute, relative, or split pattern, two characteristics are required for all amortizing patterns:

- Payment method
- Value

12.7.3.3 Payment Method

The payment methods determine the payment amount for the payment event. There are six different methods.

The following table describes the different payment methods.

Method	Description
% of Original Balance	This method calculates the payment as a percentage of the original balance; the percentage being defined by the input percent. This method is useful for apportioning the starting balance on a level principal instrument over several payments. This method is only available for payment patterns defined with a level principal payment type.
% of Current Balance	This method calculates the payment as a percentage of the current balance before payment; the percentage being defined by the input percent. This method is only available for payment patterns defined with a level principal payment type.
% of Original Payment	This method calculates the payment as a percentage of the original payment column from the detailed instrument data. This percentage is defined by the input percent.
% of Current Payment	This method calculates the payment as a percentage of the previous payment; the percentage being defined by the input percent. This payment is calculated on the payment date based on the

	characteristics of the instrument at the time of the payment, including the current rate, current balance, and current payment frequency.
Absolute Payment	This is an input payment amount. This amount represents both principal and interest for a conventional payment type and represents only principal for a level principal payment type. For both types of patterns, absolute value payment amounts are entered as gross of participations.
Interest Only	This is a calculated payment amount. An interest-only payment is calculated during processing as balance times rate times accrual factor.

12.7.3.3.1 Value

The value reflects the percentage or payment amount based on the method chosen for the payment event. Value is disabled for phases using the Interest Only payment method.

Payment amounts for conventional pattern phases must reflect both principal and interest payments. Payment amounts for the level principal pattern phase only reflect the principal portion of the payment. For level principal pattern phases, the total cash flow on a payment date is the principal amount stored as the payment plus the calculated interest.

> **NOTE** The payment method and value columns are not displayed for payment patterns defined with a non-amortizing payment type. All payments are assumed to be interested only in this type of payment pattern.

12.7.3.4 Absolute Payment Patterns

Absolute payment patterns are commonly used for instruments that pay on a seasonal schedule, such as agricultural or construction loans that require special payment handling based on months or seasons.

Take the example of a loan that follows a seasonal payment pattern, in which the payment patterns for January, February, and March are scheduled for interest-only payments. As revenues for the customer increase, the payment amount also increases. Therefore, the payments for April and May are 80% of the original payment, and June through September is 100% of the original payment. The payment decreases as the production season slows. The payment for October is decreased to 80% of the original payment, and the payments for November and December are decreased again to 50% of the original payment.

> **NOTE** You can define absolute payment patterns only for up to a year. This is because all entries are automatically ordered by date and are scheduled in a single year rotation

12.7.3.5 Relative Payment Patterns

Relative payment patterns are commonly used for modeling instruments with irregular payment frequencies or for instruments where the payment type changes over time. Take the case of a four-year loan for example. The payment for the first 12 months could only be interest. The first 35 payments are scheduled for 50% of the currently scheduled payment, and the last payment is a balloon payment for the balance of the loan.

12.7.3.6 Split Payment Patterns

A split pattern contains multiple sets of payment patterns under a single amortization code. You use a split pattern for financial instruments that make principal payments along with two concurrent amortization schedules. Each separate amortization schedule is termed a timeline and assigned a percentage of the balance. A Split Pattern can constitute both absolute and/or relative payment patterns within itself.

12.7.4 Defining Repricing Patterns

User-defined repricing patterns provide a mechanism to capture the repricing structure of instruments whose rates change according to complex schedules which cannot be captured in the standard fields of instrument tables.

The user-defined repricing pattern allows you to define multiple changes to various elements affecting repricing including:

- Rates
- Margins
- Frequency

A repricing pattern has two major components:

- User-Defined Repricing Pattern
- User-Defined Repricing Event

> **NOTE** Oracle Balance Sheet Planning Repricing Pattern interface supports simultaneous multiple-user access.

12.7.4.1 User-Defined Repricing Pattern

The user-defined repricing pattern provides you with the ability to define a series of repricing patterns and events that describe the interest rate adjustment characteristics over the life of a cash flow instrument. One repricing pattern can be assigned to many cash flow instruments. There are two types of repricing patterns that you can define:

- Absolute Repricing Pattern
- Relative Repricing Pattern

12.7.4.2 User-Defined Repricing Event

The events of a repricing pattern define changes to the interest rates of an instrument during its life. Every pattern begins with an initial event, which describes the behavior for the initial period.

> **NOTE** This initial event is required for the setup of all repricing patterns but is not used in Oracle Funds Transfer Pricing. This feature is used only by Oracle BSP when assigning a rate at the origination of new business and transaction strategy records.

The second event describes the change in behavior after the initial period is over. A third event describes the next change in behavior and so on. In relative repricing patterns, you can also define the number of times an event will be repeated before the next event is triggered.

At least one event must be defined for a repricing pattern. All events are listed in the Repricing Events table. The repricing pattern type, absolute or relative, determines the data required to be populated in the events table.

Caution: You have the option to change the repricing pattern type at any time during the creation process. However, changing the repricing pattern type causes the system to automatically refresh the Repricing Events table, and the loss of all the data that you previously entered.

12.7.4.3 Event Detail

You define each event with a repricing type of either flat rate or indexed rate. The repricing types determine the event detail characteristic that is available.

Flat Rate

Selecting the flat rate repricing type allows you to set the rate of the instrument to a fixed value. For example, 6%. The following table describes the event detail characteristics that are available when the flat rate repricing type is selected.

Characteristic	Description
Net Rate	The new net rate value
Gross Rate	The new gross rate value
Transfer Rate	The new transfer rate value

> **NOTE** The flat rate always overrides the caps and floors defined on the instrument record.

12.7.4.4 Indexed Rate

Selecting the indexed rate repricing type allows you to set the rate of the instrument to an adjustable value, defined as the index rate plus a margin. The following table describes the event detail characteristics that are available when the indexed rate repricing type is selected:

Characteristic	Description
Interest Rate Code	The reference interest rate is used as the index rate to set gross and net rates. This list of values is pulled from the current Historical Rates database.
Transfer Rate Interest Rate Code	The interest rate used to calculate the transfer rate.
Yield Curve Term	The term used in interest rate code lookups; if left blank, defaults to the term until the next repricing; set with a value and multiplier.
Net Margin	Added to the index rate to get the net rate.
Gross Margin	Added to the index rate to get the gross rate.
Transfer Margin	Added to the index rate to get transfer rate.
Rate Cap Life	The upper limit for gross rate.
Rate Floor Life	The lower limit for gross rate.
Rate Set Lag	Period by which the date of the interest rate used for calculation precedes the event date; set with a value and a multiplier.

12.7.4.5 Absolute Repricing Pattern

The absolute repricing pattern is used for instruments that are date-dependent. Each specific date is a separate event.

You may have up to one year of defined events that repeat for the life of the instrument. For example, you could define one event for each day of the year; the maximum number of events that you can define is 365. However, you can only define one event for any given date.

12.7.4.6 Relative Repricing Pattern

The relative repricing pattern is a series of repricing events that are driven by user-defined timelines. It is used for instruments where the repricing is determined by the elapsed time since origination. You specify the duration of each repricing period (frequency) and the number of times the event should occur (repeat) before calculating the next event in the pattern.

For example, an event can be defined with a frequency of 1, a multiplier of Months, and a repeat value of 3. This translates into an event that reprices every month for a duration of 3 consecutive months.

You may have a graduated rate mortgage that requires three rate changes over the life of the instrument. You will have three events following the initial event. If you wish the instrument to retain the behavior defined for the last event, the repeat value should be set to 999. This prevents wrapping, or the recycling of all the defined events until the life of the instrument runs out.

12.7.4.7 Pricing with Balance Tiers

Repricing Patterns include the option to set rates based on the balance of the instrument being priced. This selection is optional and users can select “None”, meaning there are no balance tiers needed, or they can select “Current Balance”. If Current Balance is selected, then users can define balance tier ranges and include different pricing details for each balance tier. This option is useful for applying pricing to products such as Savings Accounts or Money Market Accounts that pay different levels of interest-based on the account balance.

Balance tiered pricing can be applied to detailed instrument records or aggregate balances. When applying to aggregate balances, it is important to define the mix percentage of the portfolio for which the pricing will be applied. This is necessary because the original mix of accounts containing the related balance information is lost when the data is aggregated. The mix percentage input solves this problem. When balance tiered pricing is applied to detailed accounts, the mix percentage input is not required.

Example:

Suppose the repricing pattern is defined with the following balance tiers:

Balance > 0 and < 25,000 then current rate = 0.00%, mix % = 50%

Balance >=25,000 then current rate = 2.5%, mix % = 50%

Scenario 1, the instrument table contains detailed account records

Account #1 = $10,000

Account #2 = $10,000

Account #3 = $10,000

Account #4 = $10,000

Account #5 = $10,000

Account #6 = $50,000

The resulting rate will be [($50,000 x 0.00%) + ($50,000 x 2.50%)] / $100,000 = 1.25%

Scenario 2, the instrument table contains 1 aggregated instrument record

Account #1 = $100,000

> **NOTE** In scenario 2, the mix percentage is needed.

The resulting rate will be (0.00 x .50) + (2.50 x .50) = 1.25%

12.7.5 Loading Payment Schedule Details

Supporting instrument records that have unique payment characteristics is the Payment Schedule option. Users can directly load cash flows for individual instrument contracts into the FSI_D_PAYMENT_SCHEDULE table.

Instrument records are associated with Payment Schedules through the Amortization Type Code (AMRT_TYPE_CD) column. If the cash flow engine encounters an AMRT_TYPE_CD = 800, 801, or 802 it understands that the instrument record is associated with a Payment Schedule and will perform a lookup in the Payment Schedule table based on the IDENTITY_CODE, ID_NUMBER, and INSTRUMENT_TYPE_CD of the record being processed.

For more information, see Initializing Schedule Records and Amortization Type Code sections of Cash Flow Engine Reference Guide.

12.8 (Mandatory) Defining Time Buckets

In generating forecasts for your current book of business, the OFSAA Cash Flow Engine processes your instrument-level business data on a daily basis. Results are aggregated into "time buckets" that you specify. Time Buckets also govern how new business forecasts are generated and stored as well as the overall duration of your forecast.

In general, the OFSAA Cash Flow Engine works with versatile Time Bucket definitions. In an ALM or Liquidity Risk Management context you might want to work with several different Time Buckets. For example, in a Liquidity Risk Management context you might want to use daily buckets for 90 days followed by weekly buckets for 52 weeks. In an ALM context, you might want to use monthly time buckets for 60 months followed by annual time buckets for 5 years.

OFS Balance Sheet Planning shares the OFSAA Cash Flow Engine with other OFS applications but supports a subset of the engine's total capabilities. OFS BSP is intended to produce monthly forecasts over a chosen duration so Time Bucket modelling in BSP is limited to monthly time buckets. OFS Balance Sheet Planning supports forecasts of up to 240 months.

12.9 (Mandatory) Defining Product Characteristics

Product Characteristic rules allow you to define payment, pricing, and repricing characteristics for new businesses. They are also used to specify general calculation attributes for both existing accounts and new businesses.

Defining a Product Characteristics rule is a mandatory step in setting up and configuring the Oracle BSP Application.

12.10 (Mandatory - Deterministic) Defining Forecast Rate Scenarios

Forecast Rate scenarios allow you to define your deterministic modeling scenarios including projections for future interest rates, future currency exchange rates, and future economic indicators. The cash flow engine uses interest rate forecasts to project cash flows, including pricing new business, re-pricing existing business, calculating prepayments, determining discount methods, and determining rate-dependent forecast assumptions.

The Forecast Rates scenario rules use interest rate codes, currency codes and economic indicator codes defined/stored in Rate Management, including all the activities and reporting currencies and the primary, or functional, currency at your institution.

Defining a Forecast Rate Scenario is a mandatory step in setting up and configuring the Oracle BSP Application.

> **NOTE** OFS BSP supports Forecast Rate Scenarios having only one baseline forecast for each Interest Rate Code (IRC). BSP does not support Forecast Rate Scenarios having multiple forecast scenarios for each IRC.

12.11 Defining Prepayments

One of the major business risks faced by financial institutions engaged in the business of lending is prepayment risk. Prepayment risk is the possibility that borrowers might choose to repay part or all of their loan obligations before the scheduled due dates. Prepayments can be made by either accelerating principal payments or refinancing.

Prepayments cause the actual cash flows from a loan to a financial institution to be different from the cash flow schedule drawn at the time of loan origination.

A Prepayment Rule contains methodologies to model the prepayment behavior of various amortizing instruments and quantify the associated prepayment risk.

Prepayment methodologies are associated with the product-currency combinations within the Prepayment rule. For more information, see Defining Prepayment Methodologies.

12.11.1 Prepayment Methodologies and Rules

You can use any of the following five methods in a Prepayment rule to model the prepayment behavior of instruments:

- Constant Prepayment method
- Prepayment Model method
- PSA method
- Arctangent method
- ADCo Prepayment method

> **NOTE** For more information on the ADCo Prepayment method, see ADCo Prepayment Method.

12.11.2 Constant Prepayment Method

The Constant Prepayment method of "Use Payment Dates", calculates the prepayment amount as a flat percentage of the current balance.

You can create your origination date ranges and assign a particular prepayment rate to all the instruments with origination dates within a particular origination date range.

The Constant Prepayment method of "User-defined Prepayment Tenors" allows prepayment on any date, irrespective of contractual payment dates. You can create your own origination date ranges and define prepayment tenor(s) for each range. You can associate a specific prepayment rate for each prepayment tenor.

12.12 Prepayment Model Method

The Prepayment Model method allows you to define more complex prepayment assumptions compared to the other prepayment methods. Under this method, prepayment assumptions are assigned using a custom Prepayment model.

You can build a Prepayment model using a combination of up to three prepayment drivers and define prepayment rates for various values of these drivers. Each driver maps to an attribute of the underlying transaction (age/term or rate) so that the cash flow engine can apply a different prepayment rate based on the specific characteristics of the record.

> **NOTE** All prepayment rates should be input as annual amounts.

12.12.1.1 Prepayment Model Structure

A typical Prepayment model structure includes the following:

- Prepayment Drivers: You can build a Prepayment model using one to three prepayment drivers. A driver influences the prepayment behavior of an instrument and is either an instrument characteristic or a measure of interest rates.
- The Prepayment Driver Nodes: You can specify one or more node values for each of the prepayment drivers that you select.
- Interpolation or Range method: Interpolation or Range methods are used to calculate prepayment rates for the prepayment driver values that do not fall on the defined prepayment driver nodes.

12.12.1.2 Types of Prepayment Drivers

The prepayment drivers are designed to allow the calculation of prepayment rates at run time depending on the specific characteristics of the instruments for which cash flows are being generated. Although nine prepayment drivers are available, a particular prepayment model can contain only up to three prepayment drivers.

The prepayment drivers can be divided into the following two categories:

- **Age/Term Drivers**: The Age/Term drivers define term and repricing parameters in a Prepayment model. All such prepayment drivers are input in units of months. These drivers include:

Original Term: You can vary your prepayment assumptions based on the contractual term of the instrument. For example, you could model faster prepayment speeds for longer-term loans, such as a 10-year loan, than for short-term loans, such as a 5-year loan. You would then select the Original Term prepayment driver and specify two node values: 60 months and 120 months.

Repricing Frequency: You can vary your prepayment assumptions based on the repricing nature of the instrument being analyzed. Again, you could specify different prepayment speeds for different repricing frequencies and the system would decide which one to apply at run time on a record by record basis.

Remaining Term: You can specify prepayment speeds based on the remaining term to maturity. For example, loans with few months to go until maturity tend to experience faster prepayments than loans with longer remaining terms.

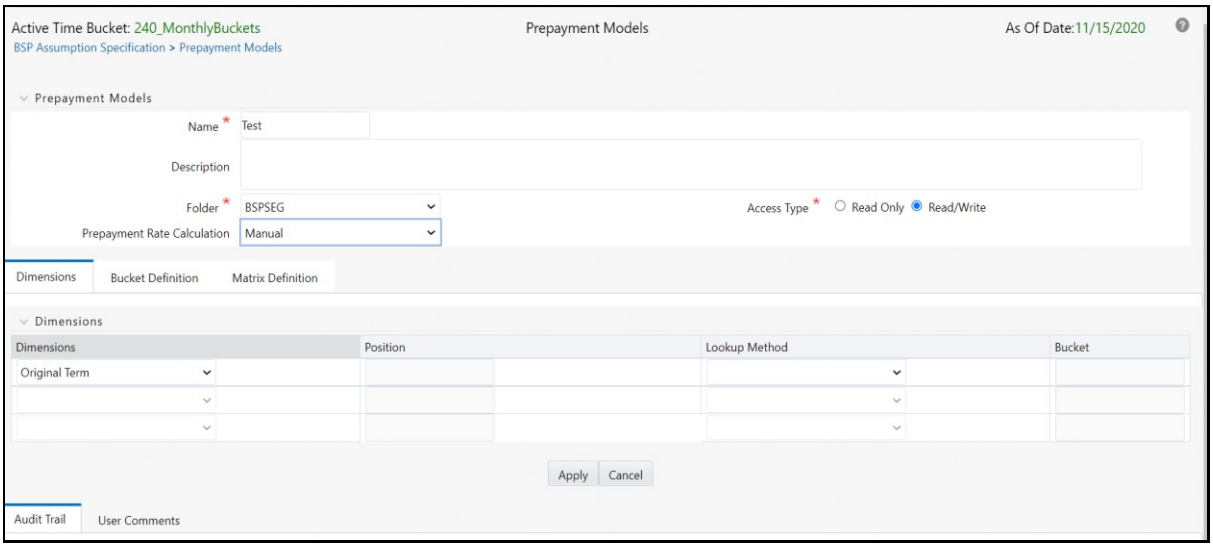
Expired Term: This is similar to the previous driver but instead of looking at the term to maturity, you base your assumptions on the elapsed time. Prepayments show some aging effects such as the loans originated recently experiencing more prepayments than older ones.

Term to Repricing: You can also define prepayment speeds based on the number of months until the next repricing of the instrument.

- **Interest Rate Drivers**: The Interest Rate drivers allow the forecasted interest rates to drive prepayment behavior to establish the rate-sensitive prepayment runoff. Interest Rate Drivers include:
  - **Coupon Rate**: You can base your prepayment assumptions on the current gross rate on the instrument.
  - **Market Rate**: This driver allows you to specify prepayment speeds based on the market rate prevalent at the time the cash flows occur. This way, you can incorporate your future expectations on the levels of interest rates in the prepayment rate estimation. For example, you can increase prepayment speeds during periods of decreasing rates and decrease prepayments when the rates go up.
  - **Rate Difference**: You can base your prepayments on the spread between the current gross rate and the market rate.
  - **Rate Ratio**: You can also base your prepayments on the ratio of current gross rate to market rate.

  The following diagram illustrates a three-driver prepayment model:

Figure 77: Prepayment Model



The ~ signifies a point on the X-Y-Z plane. In this example, it is on the second node of the Z-plane. The Z -plane behaves like layers.

Oracle Balance Sheet Planning allows you to build prepayment models using the Prepayment Model rule. The Prepayment Model rule can then be referenced by a Prepayment Rule. See Prepayment Models.

12.12.2 PSA Method

The PSA Prepayment method (Public Securities Association Standard Prepayment Model) is a standardized prepayment model that is built on a single dimension, the remaining term. The PSA curve is a schedule of prepayments that assumes that prepayments will occur at a rate of 0.2 percent CPR in the first month and will increase an additional 0.2 percent CPR each month until the 30th month and will prepay at a rate of 6 percent CPR thereafter ("100 percent PSA"). PSA prepayment speeds are expressed as a multiple of this base scenario. For example, 200 percent PSA assumes annual prepayment rates will be twice as fast in each of these periods -- 0.4 percent in the first month, 0.8 percent in the second month, reaching 12 percent in month 30 and remaining at 12 percent after that. A zero percent PSA assumes no prepayments.

You can create your own origination date ranges and assign a particular PSA speed to all the instruments with origination dates within a particular origination date range.

> **NOTE** PSA speed inputs can be between 0 and 1667.

12.12.3 Arctangent Calculation Method

The Arctangent Calculation method uses the Arctangent mathematical function to describe the relationship between prepayment rates and spreads (coupon rate less market rate).

> **Note** All prepayment rates should be input as annual amounts.

User-defined coefficients adjust this function to generate differently shaped curves. Specifically:

CPRt = k1 - (k2 * ATAN(k3 * (-Ct/Mt + k4)))

where CPRt = annual prepayment rate in period t

Ct = coupon in period t

Mt = market rate in period t

k1 - k4 = user-defined coefficients

A graphical example of the Arctangent prepayment function is shown below, using the following coefficients:

k1 = 0.3

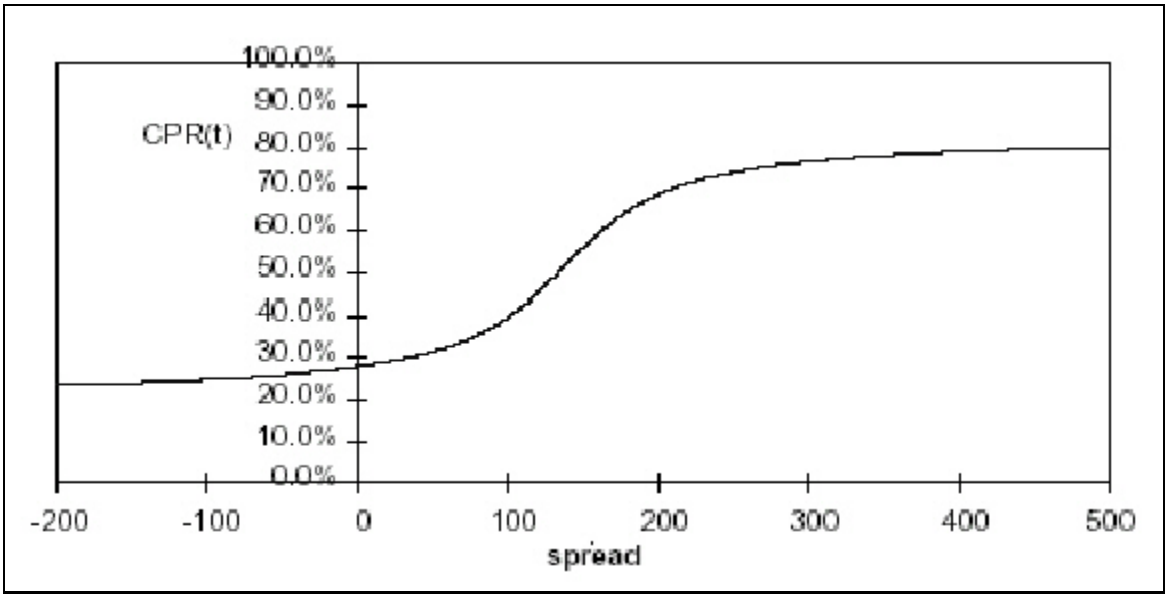
k2 = 0.2

k3 = 10.0

k4 = 1.2

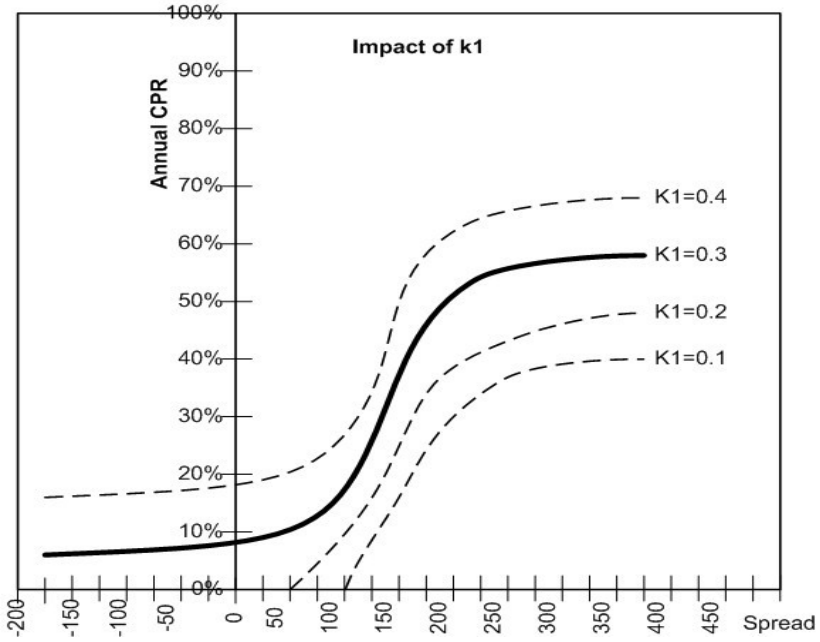
Each coefficient affects the prepayment curve differently.

Figure 78: Arctangent Prepayment Method



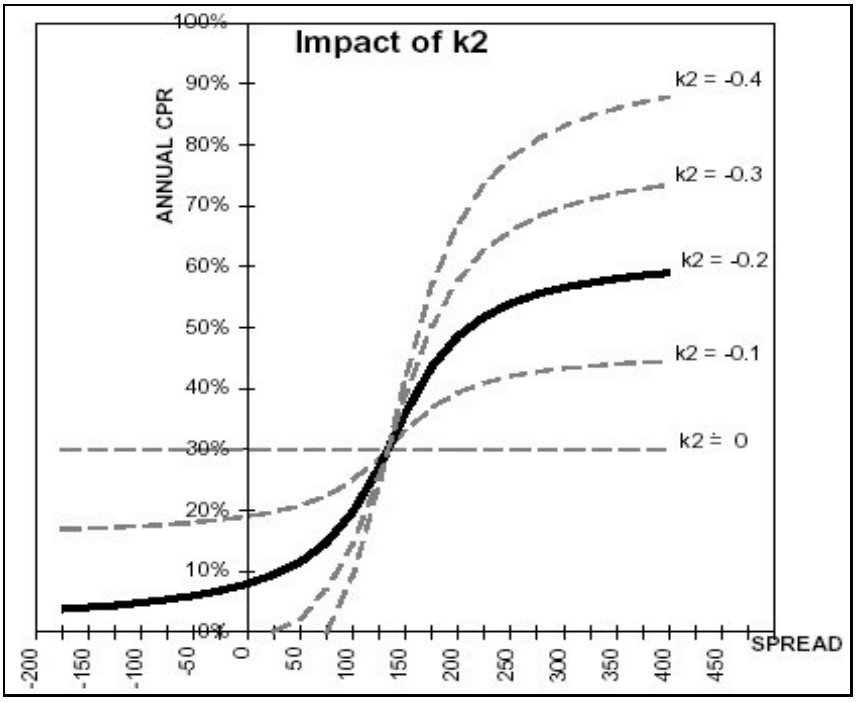
The following diagram shows the impact of K1 on the prepayment curve. K1 defines the midpoint of the prepayment curve, affecting the absolute level of prepayments. Adjusting the value creates a parallel shift of the curve up or down.

Figure 79: Impact of K1 on Prepaymet Curve



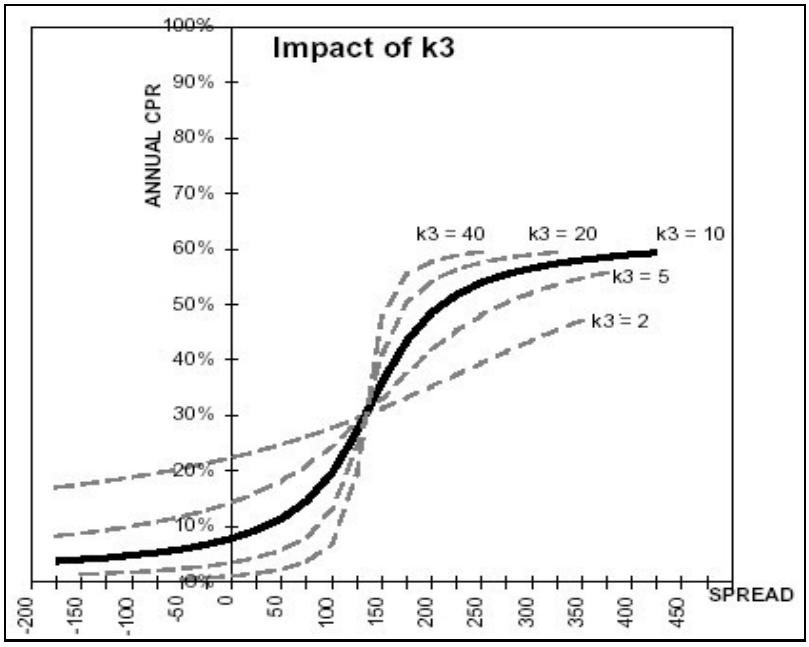
The following diagram shows the impact of K2 on the prepayment curve. K2 impacts the slope of the curve, defining the change in prepayments given a change in market rates. A larger value implies a greater overall customer reaction to changes in market rates.

Figure 80: Impact of K2 on the Prepayment Curve



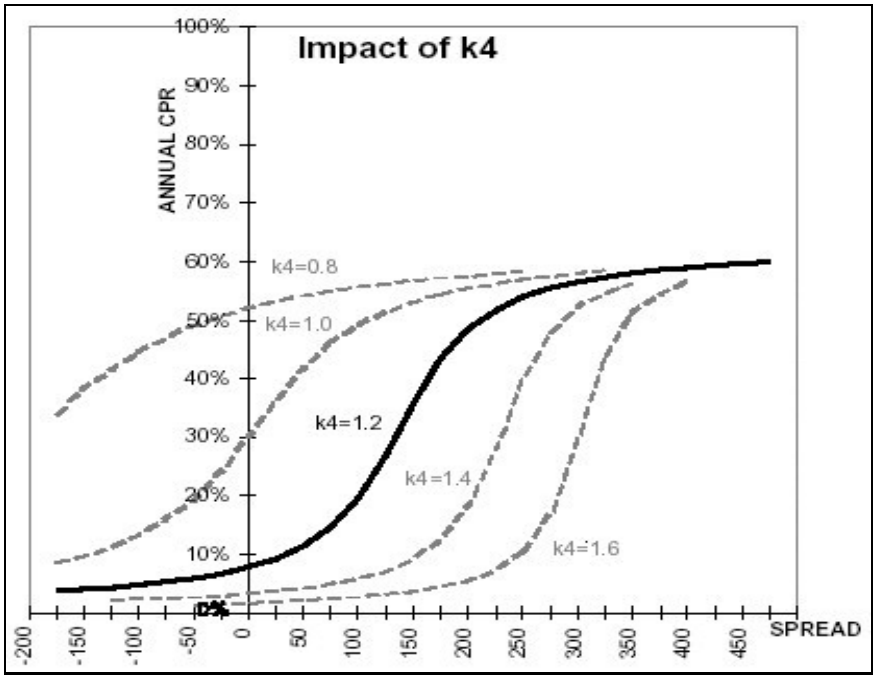
The following diagram shows the impact of K3 on the prepayment curve. K3 impacts the amount of torque in the prepayment curve. A larger K3 increases the amount of acceleration, implying that customers react more sharply when spreads reach the hurdle rate.

Figure 81: Impact of K3 on the Prepayment Curve



The following diagram shows the impact of K4 on the prepayment curve. K4 defines the hurdle spread: the spread at which prepayments start to accelerate. When the spread ratio = k4, prepayments = k1.

Figure 82: Impact of K4 on the Prepayment Curve



12.13 Defining Default Forecast Assumptions

You define new business assumptions in Oracle BSP through two different assumption rules:

- Forecast Maturity Mix
- Forecast Pricing Margins

For each of your forecasting products, Pricing Margin assumption sets allow you to specify default spreads relative to a pricing index (by currency) for each forecast month. When working with Forecast Sets in BSP's planning user interfaces, users can change this default margin and/or pricing method.

For each of your forecasting products, Maturity Mix assumption sets allow you to specify maturity terms (by currency) for each forecast month. BSP Planning Users can not modify the Maturity Mix assumptions specified by the BSP System Administrator.

12.14 Defining Transfer Pricing Rules

Defining Transfer Pricing rules is one of the optional steps in the Oracle Balance Sheet Planning process. You must define Transfer Pricing rules, to transfer price your forecasted balances. A Transfer Pricing rule is used to manage the association of transfer pricing methodologies to various product-currency combinations. It can also be used to manage certain parameters used in option costing.

See: Defining Transfer Pricing Methodologies Using Node Level Assumptions

To reduce the amount of effort required to define the transfer pricing methodologies for various products and currencies, Oracle Funds Transfer Pricing allows you to define transfer pricing methodologies using node level and conditional assumptions.

Node Level Assumptions

Oracle Balance Sheet Planning uses the Product Dimension that has been selected within Application Preferences, to represent a financial institution's product portfolio. Using this dimension, you can organize your product portfolio into a hierarchical structure and define parent-child relationships for different nodes of your product hierarchy. This significantly reduces the amount of work required to define transfer pricing, prepayment, adjustment rule methodologies, and other BSP assumption rules.

You can define transfer pricing, prepayment, adjustment rule methodologies, and other BSP assumption rules at any level of your product hierarchy. Children of parent nodes on a hierarchy automatically inherit the methodologies defined for the parent nodes. However, methodologies directly defined for a child take precedence over those at the parent level. See Defining Transfer Pricing Methodologies Using Node Level Assumptions.

Conditional Assumptions

The conditional assumption feature allows you to segregate your product portfolio based on common characteristics, such as term to maturity, origination date, and repricing frequency, and assign specific transfer pricing methodologies to each of the groupings.

For example, you can slice a portfolio of commercial loans based on repricing characteristics and assign one global set of Transfer Pricing, Prepayment, Adjustment Rule Methodologies, or other BSP assumption rules to the fixed-rate loans and another to the floating-rate loans.

12.15 Transfer Pricing Methodologies and Rules

The transfer pricing methodologies supported by Oracle Balance Sheet Planning can be grouped into the following two categories:

- Cash Flow Transfer Pricing Methods: Cash flow transfer pricing methods are used to transfer price instruments that amortize over time. They generate transfer rates based on the cash flow characteristics of the instruments.

  To generate cash flows, the system requires a detailed set of transaction-level data attributes, such as, origination date, outstanding balance, contracted rate, and maturity date, which resides only in the Instrument tables. Consequently, cash flow methods apply only if the data source is Account tables. Data stored in the Management Ledger Table reflects only accounting entry positions at a particular point in time and does not have the required financial details to generate cash flows, thus preventing you from applying cash flows methodologies to this data.

  The cash flow methods are also unique in that Prepayment rules are used only with these methods. You can select the required Prepayment rule when defining a BSP Process.

  Oracle Balance Sheet Planning supports the following cash flow transfer pricing methods:

  Cash Flow: Average Life

  Cash Flow: Duration

  Cash Flow: Weighted Term

  Cash Flow: Zero Discount Factors

- Non-cash Flow Transfer Pricing Methods: These methods do not require the calculation of cash flows. Oracle Balance Sheet Planning supports the following non-cash flow transfer pricing methods:

  Moving Averages

  Straight Term

  Spread from Interest Rate Code

  Spread from Note Rate

  Redemption Curve

12.15.1 Cash Flow: Average Life

The Average Life method determines the average life of the instrument by calculating the effective term required to repay half of the principal or nominal amount of the instrument. The TP rate is equivalent to the rate on the associated interest rate curve corresponding to the calculated term.

Figure 83: Cash Flow: Average Life Formula

$$\text{Average Life} = \sum_{i=1}^{n} \frac{P_i}{P} t_i$$

Where:

P is the principal

P_i is the principal repayment in coupon i, hence

$\frac{P_i}{P}$ is the fraction of the principal repaid in coupon i, and

t_i is the time from the start of coupon i

Oracle Balance Sheet Planning derives the Average Life based on the cash flows of an instrument as determined by the characteristics specified in the Instrument Table and using your specified prepayment rate, if applicable. The average life formula calculates a single term, that is, a point on the yield curve used to transfer price the instrument being analyzed.

NOTE The Average Life TP Method provides the option to Output the result of the calculation to the instrument record (TP_AVERAGE_LIFE). This can be a useful option if you would like to see the average life as a reference term within an Adjustment Rule.

12.15.2 Cash Flow: Duration

The Duration method uses the Macaulay duration formula:

Figure 84: Cash Flow: Duration Formula

$$\text{Duration} = \frac{\sum_{n=1}^{N}\left[\frac{CF_n}{(1+r)^m} \times t_n\right]}{\sum_{n=1}^{N}\left[\frac{CF_n}{(1+r)^m}\right]}$$

In this formula:

N = Total number of payments from Start Date until the earlier of repricing or maturity

- CFn = Cash flow (such as regular principal, prepayments, and interest) in period n
- r = Periodic rate (current rate/payments per year)
- m = Remaining term to cash flow/active payment frequency
- tn= Remaining term to cash flow n, expressed in years

Oracle Balance Sheet Planning derives the Macaulay duration based on the cash flows of an instrument as determined by the characteristics specified in the Instrument Table and using your specified prepayment rate, if applicable. The duration formula calculates a single term, that is, a point on the yield curve used to transfer price the instrument.

- Within the Duration calculation, the discount rate or current rate, r, is defined in one of three ways, based on how the methodology is set up by the user:

  The current rate is defined as the current net rate if the processing option, "Model with Gross Rates" is not selected and the current gross rate if the option is selected. The current rate is used as a constant discount rate for each cash flow.

  The user may directly input while defining the TP rule, a constant rate to use for discounts. If specified, this rate is used as a constant discount rate for each flow.

  The user can select to discount the cash flows using spot rates from a selected interest rate curve. With this approach, a discount rate is read from the selected interest rate curve corresponding to the term of each cash flow.

- The remaining term to cash flow is the difference between the date of each cash flow and the modeling start date for that instrument.

> **NOTE** The Duration TP Method provides the option to Output the result of the calculation to the instrument record (TP_DURATION). This can be a useful option if you would like to see the duration as a reference term within an Adjustment Rule

12.15.3 Cash Flow: Weighted Term

The Weighted Term method builds on the theoretical concepts of duration. As shown earlier, duration calculates a weighted-average term by weighting each period, n, with the present value of the cash flow (discounted by the rate on the instrument) in that period.

Figure 85: Weighted Average Formula

Weighted Average = y = ∑

Since the goal of the Weighted Term method is to calculate a weighted average transfer rate, it weights the transfer rate in each period, yn, by the present value for the cash flow of that period. Furthermore, the transfer rates are weighted by an additional component, time, to account for the length of time over which a transfer rate is applicable. The time component accounts for the relative significance of each strip cash flow to the total transfer pricing interest income/expense. The total transfer pricing interest income/expense on any cash flow is a product of that cash flow, the transfer rate, and the term. Hence, longer-term cash flows will have a relatively larger impact on the average transfer rate. The Weighted Term method, with the "Discounted Cash Flow" option selected, can be summarized by the following formula:

Figure 86: Weighted Average Formula with Discounted Cash Flow

$$\text{Weighted-Average} = \bar{y} = \frac{\sum_{n=1}^{N}\left[y_n \times \frac{CF_n}{(1+r)^m} \times t_n\right]}{\sum_{n=1}^{N}\left[\frac{CF_n}{(1+r)^m} \times t_n\right]}$$

In this formula:

- N = Total number of payments from Start Date until the earlier of repricing or maturity
- CFn = Cash flow (such as regular principal, prepayments, and interest) in period n
- r = Periodic coupon rate on instrument (current rate/payments per year)
- m = Remaining term to cash flow n/active payment frequency
- tn = Remaining term to cash flow n, expressed in years
- yn = Transfer rate in period n

Within the Weighted Average Cash Flow method definition screen, users can choose whether or not to discount the cash flows as described earlier. If the "Cash Flow" option is selected, rather than the "Discounted Cash Flow", the following simplified formula is applied:

Figure 87: Cash Flow: Weighted Term Formula without Discounted Cash Flow

$$\text{Weighted Average} - y - \left(\frac{\Sigma_{n=1}^{N}\left[y_n \times CF \times t_n\right]}{\Sigma_{n-1}^{N}\left[CF \times t_n\right]}\right)$$

12.15.4 Cash Flow: Zero Discount Factors

The Zero Discount Factors (ZDF) method takes into account common market practices in valuing fixed-rate amortizing instruments. For example, all Treasury strips are quoted as discount factors. A discount factor represents the amount paid today to receive $1 at maturity date with no intervening cash flows (that is, zero-coupon).

The Treasury discount factor for any maturity (as well as all other rates quoted in the market) is always a function of the discount factors with shorter maturities. This ensures that no risk-free arbitrage exists in the market. Based on this concept, one can conclude that the rate quoted for fixed-rate amortizing instruments is also a combination of some set of market discount factors. Discounting the monthly cash flows for that instrument (calculated based on the constant instrument rate) by the market discount factors generates the par value of that instrument (otherwise there is arbitrage).

ZDF starts with the assertion that an institution tries to find a funding source that has the same principal repayment factor as the instrument being funded. In essence, the institution strip funds each principal flow using its funding curve (that is, the transfer pricing yield curve). The difference between the interest flows from the instrument and its funding source is the net income from that instrument.

Next, ZDF tries to ensure consistency between the original balance of the instrument and the amount of funding required at origination. Based on the transfer pricing yield used to fund the instrument, the ZDF solves for a single transfer rate that would amortize the funding in two ways:

- Its principal flows match those of the instrument.
- The Present Value (PV) of the funding cash flows (that is, the original balance) matches the original balance of the instrument.

ZDF uses zero-coupon factors (derived from the original transfer rates, see the following example) because they are the appropriate vehicles in strip funding (that is, there are no intermediate cash flows between origination date and the date the particular cash flow is received). The zero-coupon yield curve can be universally applied to all kinds of instruments.

This approach yields the following formula to solve for a weighted average transfer rate based on the payment dates derived from the instrument's payment data.

Figure 88: Zero Discount Factors = y =

$$100 \times \left[\frac{B_0 - \sum_{n=1}^{N}(B_{n-1} \times DTP_n) + \sum_{n=1}^{N}(B_n \times DTP_n)}{\sum_{n=1}^{N}(B_{n-1} \times DTP_n)} \right] \times \mathrm{p}$$

In this formula:

- B0 = Beginning balance at the time, 0
- Bn-1 = Ending balance in the previous period
- Bn = Ending balance in the current period
- DTPn = Discount factor in period n based on the TP yield curve
- N = Total number of payments from Start Date until the earlier of repricing or maturity
- p = Payments per year based on the payment frequency; (for example, monthly payments gives p=12)

Deriving Zero Coupon Discount Factors: An Example

This table illustrates how to derive zero coupon discount factors from monthly pay transfer pricing rates:

Table 3: Deriving Zero Coupon Discount Factors

Term in Months	(a) Monthly Pay Transfer Rates	(b) Monthly Transfer Rate: (a)/12	(c) Numerator (Monthly Factor): 1+ (b)	(d) PV of Interest Payments: (b)*Sum((f)/100 to current row	(e) Denominator (1 - PV of Int Pmt): 1 - (d)	(f) Zero Coupon Factor: [(e)/(c) * 100
1	3.400%	0.283%	1.002833	0.000000	1.000000	99.7175
2	3.500%	0.292%	1.002917	0.002908	0.997092	99.4192
3	3.600%	0.300%	1.003000	0.005974	0.994026	99.1053

12.15.5 Moving Averages

Under this method, a user-definable moving average of any point on the transfer pricing yield curve can be applied to a transaction record to generate transfer prices. For example, you can use a 12-month moving average of the 12-month rate to transfer price of a particular product.

The following options become available on the user interface (UI) with this method:

- Interest Rate Code: Select the Interest Rate Code to be used as the yield curve to generate transfer rates.
- Yield Curve Term: The Yield Curve Term defines the point on the Interest Rate Code that is used.
- Historical Range: The Historical Range defines the period over which the average is calculated.

The following table illustrates the difference between the yield curve and historical terms.

Table 4: Difference between Yield Curve and Historical Terms

Moving Average	Yield Curve Term	Historical Range
Six-month moving average of the 1-year rate	1 year (or 12 months)	6 months
Three-month moving average of the 6-month rate	6 months	3 months

The range of dates is based on the As of date minus the historical Range plus one, because the historical Range includes the As of date. Oracle Balance Sheet Planning takes the values of the yield curve points that fall within that range and does a straight average on them.

For example, if As of Date is Nov 21, the Yield Curve Term selected is Daily, and the Historical Range selected is 3 Days, then, the system will calculate the three-day moving average based on the rates for Nov 19, 20, and 21. The same logic applies to monthly or annual yield terms.

12.15.6 Straight Term

When you select the Straight Term method, the system derives the transfer rate using the last repricing date and the next repricing date for adjustable-rate instruments, and the origination date and the maturity date for fixed-rate instruments.

1. Standard Calculation Mode:
   - For Fixed Rate Products (Repricing Frequency = 0), use Yield Curve Date = Origination Date, Yield Curve Term = Maturity Date-Origination Date.
   - For Adjustable Rate Products (Repricing Frequency > 0)

     For loans still in tease period (tease end date > As of Date, and tease end date > origination date), use Origination Date and Tease End Date - Origination Date.

     For loans not in tease period, use Last Repricing Date and Repricing Frequency.
2. Remaining Term Calculation Mode:
   - For Fixed Rate Products, use As of Date and Maturity - As of Date.
   - For Adjustable Rate Products, use As of Date and Next Repricing Date - As of Date.

The following options become available on the application with this method:

- Interest Rate Code: Select the Interest Rate Code to be used for transfer pricing the account.

12.15.7 Spread from Interest Rate Code

Under this method, the transfer rate is determined as a fixed spread from any point on an Interest Rate Code. The following options become available on the application with this method:

- Interest Rate Code: Select the Interest Rate Code for transfer pricing the account.
- Yield Curve Term: The Yield Curve Term defines the point on the Interest Rate Code that will be used to transfer price. If the Interest Rate Code is a single rate, the Yield Curve Term is irrelevant. Select Days, Months, or Years from the drop-down list, and enter the number.
- Lag Term: While using a yield curve from an earlier date than the Assignment Date, you need to assign the Lag Term to specify a length of time before the Assignment Date.
- Rate Spread: The transfer rate is a fixed spread from the rate on the transfer rate yield curve. The Rate Spread field allows you to specify this spread.
- Assignment Date: The Assignment Date allows you to choose the date for which the yield curve values are to be picked up. Choices available are the As of Date, Last Repricing Date, Origination Date, or TP Effective Date.

12.15.8 Spread from Note Rate

To generate transfer prices using this method, you need to provide just one parameter: a rate spread. This spread is added or subtracted from the coupon rate of the underlying transaction to generate the final transfer rate for that record.

While entering the rate spread, make sure to input it with the appropriate positive or negative sign, as illustrated in the following table. The first row describes a situation where you are transfer pricing an

asset and want to have a positive matched spread for it (the difference between the contractual rate of the transaction and the transfer rate is positive). Here, you need to enter a negative rate spread.

Table 5: Example of Rate Spread

Account Type	Matched Spread	Sign of Rate Spread
Asset	Negative	Positive (Profitable)
Asset	Positive	Negative (Unprofitable)
Liability or Equity	Positive	Positive (Profitable)
Liability of Equity	Negative	Negative (Unprofitable)

12.15.9 Redemption Curve

This method allows you to select multiple-term points from your transfer pricing yield curve and calculate an average transfer rate based on the weights you assign to each term point. The following options become available in the application with this method:

- Interest Rate Code: Select the Interest Rate Code which you want to use as the transfer pricing yield curve.
- Assignment Date: The Assignment Date allows you to choose the date for which the yield curve values will be picked up. Choices available are the As of Date, Last Repricing Date, Origination Date, or TP Effective Date.
- Percentages/Term Points: Defining the Redemption Curve Methodology.

12.16 Defining Transfer Pricing Methodologies Using Node Level Assumptions

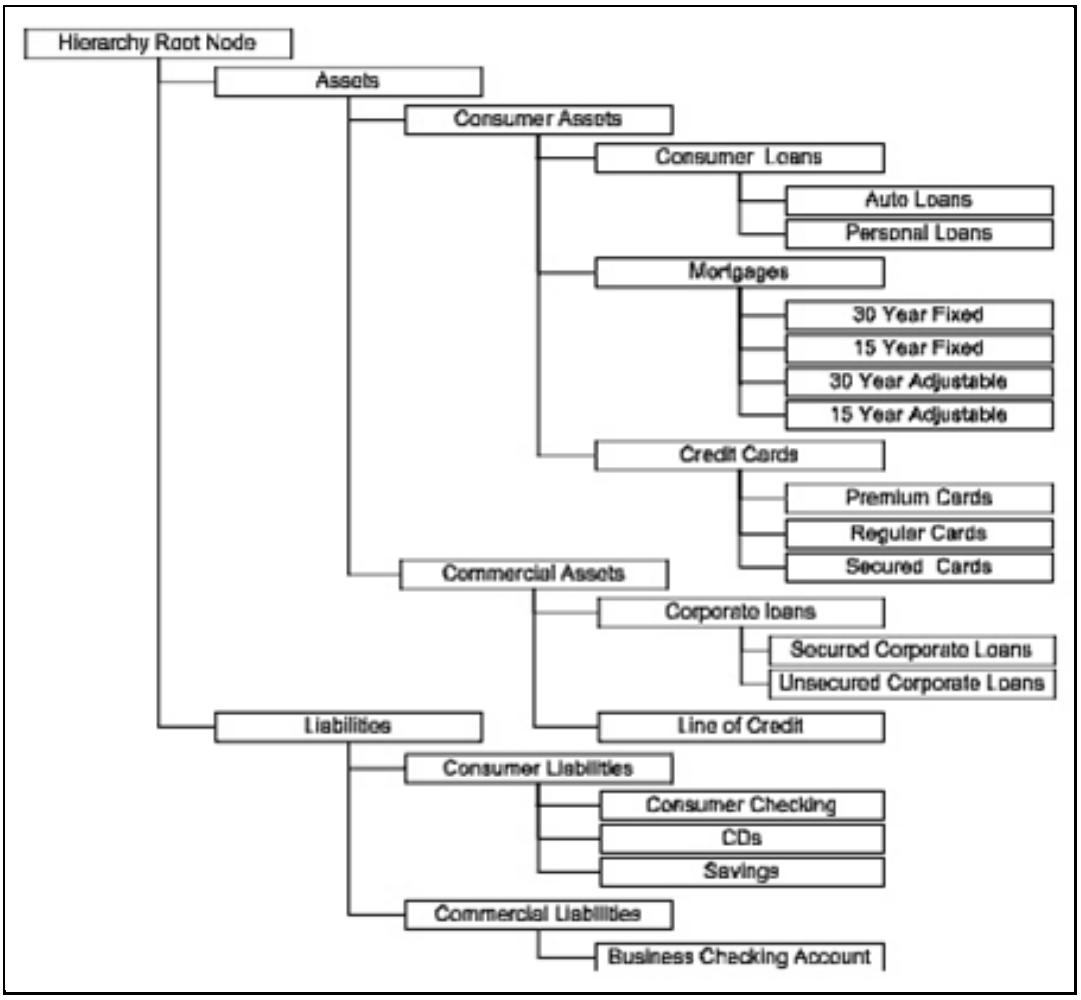
In Oracle Balance Sheet Planning, your product portfolio is represented using the Product Dimension specified in your BSP Application Preferences. Node Level Assumptions allow you to define transfer pricing, prepayment, adjustment, and other BSP Rule assumptions at any level of the Product dimension Hierarchy. The Product dimension supports a hierarchical representation of your chart of accounts, so you can take advantage of the parent-child relationships defined for the various nodes of your product hierarchies while defining transfer pricing, prepayment, adjustment, and other BSP Rule assumptions. Child nodes for which no assumptions have been specified automatically inherit the methodology of their closest parent node. Conversely, explicit definitions made at a child level will take precedence over any higher-level parent node assumption.

Node level assumptions simplify the process of applying rules in the user interface and significantly reduce the effort required to maintain business rules over time as new products are added to the product mix. It is also not required for all rules to assign assumptions to the same nodes. Users may assign assumptions at different levels throughout the hierarchy.

The behavior of Node Level Assumptions

The following graphic displays a sample product hierarchy:

Figure 89: Sample Product Hierarchy



If you want to transfer price this product hierarchy using the Spread from Interest Rate Code transfer pricing method except for the following products:

- Mortgages: You want to transfer price these using the Zero Discount Factors cash flow based method.
- Credit Cards: You want to transfer price all but secured credit cards using the Spread from Note Rate method.

To transfer price in this manner, you need to attach transfer pricing methods to the nodes of the product hierarchy as follows:

- Hierarchy Root Node: Spread from Interest Rate Code
- Mortgages: Zero Discount Factors Cash Flow
- Credit Cards: Spread from Note Rate
- Secured Credit Cards: Spread from Interest Rate Code

The transfer pricing method for a particular product is determined by searching up the nodes in the hierarchy. Consider the Secured Credit Cards in the above example. Since Spread from IRC is specified at the leaf level, the system does not need to search any further to calculate the transfer rates for the Secured Credit Cards. However, for a Premium Credit Card, the system searches up the hierarchical

nodes for the first node that specifies a method. The first node that specifies a method for the Premium Credit Card is the Credit Card node and it is associated with the Spread from Note Rate method.

> **NOTE** Child nodes for which no assumptions have been specified automatically inherit the methodology of their closest parent node. So if neither a child node nor its immediate parent has a method assigned, the application searches up the nodes in the hierarchy until it finds a parent node with a method assigned, and uses that method for the child node. If there are no parent nodes with a method assigned then the application triggers a processing error stating that no assumptions are assigned for the particular product/currency combination.

All parameters that are attached to a particular methodology (such as Interest Rate Code) are specified at the same level as the method. If multiple Interest Rate Codes are to be used, depending on the type of the product, the method would need to be specified at a lower level. For instance, if you want to use IRC 211178 for Consumer Products and IRC 3114 for Commercial Products, then the transfer pricing methodologies for these two products need to be specified at the Commercial Products and Consumer Products nodes.

You need not specify prepayment assumptions at the same nodes as transfer pricing methods. For example, each mortgage category can have a different prepayment method while the entire Mortgage node uses the Zero Discount Factors cash flow method for transfer pricing.

12.17 Defining Adjustment Rules

Adjustment Rules allow users to define Transfer Pricing Add-on rates that are assigned incrementally to the base FTP rate to account for a variety of miscellaneous risks such as Liquidity risk or Basis risk or to supplement strategic decision making through the use of Pricing Incentives, Breakage Charges, or other types of rate adjustments.

Within both the Standard and Stochastic Transfer Pricing Processes, users can select an appropriate Adjustment rule to calculate add-on rates or breakage charges.

Add-on rates can be a fixed rate, a fixed amount, or a formula-based rate. Breakage Charges can be a fixed percentage, a fixed amount or can be calculated on an Economic Loss basis. The adjustments are calculated and output separately from the base funds transfer pricing rate, so they can be easily identified and reported. In addition, Adjustments allow you to apply event-based logic through the use of conditional assumptions that are applied or varied only if a specific condition is satisfied.

12.17.1 Adjustment Methods and Rules

You can use any of the following methods in an Adjustment rule when the selected Adjustment Type is Liquidity Premium, Basis Risk Cost, Pricing Incentive, or Other Adjustment:

- Fixed-Rate
- Fixed Amount
- Formula Based Rate

- Use TP Method from selected TP Rule

Alternatively, you can use any of the following methods in an Adjustment rule when the selected Adjustment Type is Breakage Charge:

- Economic Loss
- Fixed Amount
- Fixed Percentage

For more information on Breakage Charge, see Oracle Financial Services Funds Transfer Pricing User Guide.

12.17.1.1 Adjustment - Fixed Rate

The Fixed Amount Adjustment method allows the user to associate an amount with specific terms or term ranges. Reference term selections include

- Repricing Frequency: The fixed amount is matched to the specified reprice frequency of the instrument. If the instrument is fixed rate and, therefore, does not have a reprice frequency, the fixed amount lookup happens based on the original term of the instrument.
- Original Term: The calculation assigns the fixed amount based on the original term on the instrument.
- Remaining Term: The calculation assigns the fixed amount based on the remaining term of the instrument.

The remaining term value represents the remaining term of the contract and is expressed in days.

Remaining Term = Maturity Date – As of Date

- Duration (read from the TP_DURATION column): The calculation assigns the fixed amount based on the Duration of the instrument, specified in the TP_DURATION column.
- Average Life (read from the TP_AVERAGE_LIFE column): The calculation assigns the fixed amount based on the Average Life of the instrument, specified in the TP_AVG_LIFE column.

You can create your own reference term ranges and assign a particular adjustment amount to all instruments with a reference term falling within the specified range.

> **NOTE** All adjustment rates should be input as annual rates.

12.17.1.2 Adjustment - Fixed Amount

The Fixed Amount Adjustment method allows the user to associate an amount with specific terms or term ranges. Reference term selections include:

- Repricing Frequency: The calculation retrieves the rate for the term point equaling the reprice frequency of the instrument. If the instrument is fixed rate and, therefore, does not have a reprice frequency, the calculation retrieves the rate associated with the term point equaling the original term on the instrument.
- Original Term: The calculation retrieves the rate for the term point equaling the original term on the instrument.

- Remaining Term: The calculation retrieves the rate for the term point corresponding to the remaining term of the instrument. The remaining term value represents the remaining term of the contract and is expressed in days. Remaining Term = Maturity Date – As of Date
- Duration (read from the TP_DURATION column): The calculation retrieves the rate for the term point corresponding to the Duration of the instrument, specified in the TP_DURATION column.
- Average Life (read from the TP_AVERAGE_LIFE column): The calculation retrieves the rate for the term point corresponding to the Average Life of the instrument, specified in the TP_AVG_LIFE column.

You can create your own reference term ranges and assign a particular adjustment amount to all instruments with a reference term falling within the specified range.

> **NOTE** All adjustment amounts should be input in base currency for the selected product/currency combination.

12.17.1.3 Adjustment - Formula Based Rate

The Formula Based Rate Adjustment method allows the user to determine the add-on rate based on a lookup from the selected yield curve, plus a spread amount, and then the resulting rate can be associated with specific terms or term ranges. Reference term selections include:

- Repricing Frequency: The calculation retrieves the rate for the term point equaling the reprice frequency of the instrument. If the instrument is fixed rate and, therefore, does not have a reprice frequency, the calculation retrieves the rate associated with the term point equaling the original term on the instrument.
- Original Term: The calculation retrieves the rate for the term point equaling the original term on the instrument.
- Remaining Term: The calculation retrieves the rate for the term point corresponding to the remaining term of the instrument. The remaining term value represents the remaining term of the contract and is expressed in days.

  Remaining Term = Maturity Date – As of Date
- Duration (read from the TP_DURATION column): The calculation retrieves the rate for the term point corresponding to the Duration of the instrument, specified in the TP_DURATION column.
- Average Life (read from the TP_AVERAGE_LIFE column): The calculation retrieves the rate for the term point corresponding to the Average Life of the instrument, specified in the TP_AVG_LIFE column.

You can create your own reference term ranges and assign a particular formula-based adjustment rate to all instruments with a reference term falling within the specified range.

With this method, you also specify the Interest Rate Code and define an Assignment Date for the Rate Lookup. The Interest Rate Code can be any IRC defined within Rate Management, but will commonly be a Hybrid IRC defined as a Spread Curve (e.g. Curve A – Curve B).

Assignment Date selections include:

- As of Date
- Last Repricing Date

- Origination Date
- TP Effective Date
- Adjustment Effective Date
- Commitment Start Date

The formula definition is comprised of the following components:

- Term Point: This allows you to associate a specific term point from the IRC to each Term Range.
- Coefficient: This allows you to define a multiplier that is applied to the selected rate.
- Rate Spread: This allows you to define an incremental rate spread to be included on top of the IRC rate.

The resulting formula for the adjustment rate is: (Term Point Rate * Coefficient) + Spread

> **NOTE** For increased precision, you can reduce the Term Ranges to smaller term increments allowing you to associate specific IRC rate tenors with specific terms.

12.17.1.4 Adjustment – Use TP Method from Selected TP Rule

The "Use TP Method from Selected TP Rule" selection allows the user to calculate the add-on rate based on any TP method available in the selected Transfer Pricing Rule.

Users have the option to attach any Transfer Pricing Rule on the Adjustment Rule summary page, separately for each type of add-on rate. The TP Methods mapped to product hierarchy members in the TP Rule will be read during the adjustment rate calculation process and will be applied during the calculation of the Adjustment Rate(s). Outputs will be written to the respective Adjustment Rate column, e.g. Basis Risk Cost Rate, Liquidity Premium Rate, Pricing Incentive Rate, or Other Adjustment Rate.

12.18 (Mandatory) Defining and Running the Balance Sheet Planning Process

When all of the assumptions for a forecast are defined, users can define and execute BSP Processes where they combine the relevant assumptions into a BSP simulation run. BSP Processes initialize all selected assumption data and call the cash flow engine to execute the selected calculation processes and generate a result set. A BSP Process requires specific inputs based on the BSP Process type, including:

- Product Hierarchy / Data Source selection
- Calculation Elements
- Process Assumption Rules
- Output Preferences
- Audit Preferences
- Processing Parameters

Defining options within each of these pages and saving the process creates a unique Process Identifier for individual forecasting objectives.

12.19 Reviewing Processing Errors

There is always the possibility that errors may occur during the execution of a BSP Process. A log of such errors is generated during processing and can be accessed by selecting the "View Log" link from the BSP Process summary pages.

Within this log, the report lists the specific transaction for which an error was generated and provides the internally generated identifier of the BSP Process that generated it.

As part of the rectification process, it is advisable to determine what caused the error and what should be done to correct it for the next run.

12.20 Accessing Balance Sheet Planning, Detail Cash Flow Results

Detailed cash flow results for individual account records can be written to an audit table for validation purposes. If you select the Detailed Cash Flows audit option on the BSP Process - Audit Block, the detailed cash flow results are written to the FSI_O_PROCESS_CASH_FLOWS table.

Application Preferences > Maximum Number of Instrument Records to Include in Detail Cash Flow Output

12.21 Analyzing Results

You should always analyze results obtained from the BSP Engine. For example, you should review the forecast rate – audit information to ensure that the new business rates and resulting interest accruals have been generated correctly for each scenario.

In addition, you should review both your beginning balances and resulting balances in each forecast period as well as your scenario-specific behavioral assumptions to verify that assumptions have been defined and applied correctly.

The following relational database tables are populated with BSP Static Deterministic process results and can be queried directly by a SQL query tool such as Oracle SQL Developer:

Table 6: Database Tables Populated with Static Deterministic Process

Table Name	Description	Sample SQL query
Result Master	Static and point-in-time information such as current balance, current rate, current transfer rate, yield to maturity, market value, duration, DV01, and convexity are stored in this table for each Product COA member included in the process, for all scenarios associated with the process. Result Master data is stored in original / base currency.	select * from fsi_o_result_master where result_sys_id=xxxxxx order by start_date_index, scenario_num, product_id;
Result Detail	Cash flow results are stored in result detail and are spread across columns based on the "active" time bucket rule used when the process was run. Each row of data represents a distinct Financial Element such as Beginning Balance, Average Balance, Ending Balance, Interest Cash Flow, Principal Cash Flow, and so on. Result Detail data is stored in original/base currency.	select * from res_dtl_xxxxxx order by start_date_index, scenario_num, product_id, financial_elem_id, result_type_cd;

12.22 Reprocessing Erroneous Accounts

While reviewing your results, you might discover accounts with invalid results that need to be reprocessed. Oracle BSP Processes allow you to rerun a subset of information to make corrections to appropriate products when needed.

If you need to reprocess a portion of your instrument data, make sure that you reprocess all the Product dimensions members, across all instrument tables where relevant data exists.

13 Common Rule Management Tasks

This section focuses on the rule management tasks that are common across all rules in this application.

This chapter covers the following topics:

13.1 Overview of Common Rule Management Tasks

The rule management tasks that are common to business rules in this and other OFSAA applications are as follows.

- The Rule Summary Page
- Searching for Rules
- Creating Rules
- Viewing and Editing Rules
- Copying Rules
- Deleting Rules

> **NOTE** You can perform these tasks from the Summary page for the type of rule with which you are working. Depending on the rule type, some tasks might not be available.

The procedures for carrying out these tasks are the same for each rule type, except for rule-specific steps explicitly stated in the rule-specific documentation.

13.2 The Rule Summary Page

The Rule summary page is the gateway to all rules and related functionality of the application. From there, you can navigate to other related pages. On the header of the Rule summary page, you can perform simple queries on Folder, Rule Name, and in many cases, the dimension upon which the rule is based.

The following table shows the page components.

Table 7: Fields and Descriptions from the Rule Summary Page

Name	Type	Default Value	Required/Optional	Updatable	LOV, additional information
Folder	Drop Down	Set in Application Preferences	Required - for filtering the rules under the folder	No – Only able to select from the presented list.	N/A
(Rule) Name	Text Box	None	Optional – for filtering the rules on Rule Name	Yes	You can specify all or part of a rule name. For example, if you want to see only those Rules which start with 'A' – Enter A in the text field.
Dimension	Drop Down	Set in Application Preferences		No - Only able to select from the presented list	N/A
Search	Button	N/A	N/A	No	Initiates rule search based on specified criteria.
Reset	Button	N/A	N/A	No	Restores default search criteria.
Add	Button	N/A	N/A	No	Initiates the Data or Ledger Loader rule creation process
(Rule) Name	Display Value	N/A	N/A	No	Mouse-over shows the rule description and in some cases also displays the unique system ID number.
Created By	Display Value	N/A	N/A	No	Who created the Rule version.
Creation Date	Display Value	N/A	N/A	No	When was the rule created?
Last Modified By	Display Value	N/A	N/A	No	Who last modified the rule.
Last Modified Date	Display Value	N/A	N/A	No	When the rule was last modified.
View	Icon	N/A	N/A	N/A	Opens the selected rule in read-only mode.
Edit	Icon	N/A	N/A	N/A	Opens the selected rule in edit mode.
Delete	Icon	N/A	N/A	N/A	Deletes the selected Rule.
Copy	Icon	N/A	N/A	N/A	Initiates process for copying rules. Explained later in this document.

Name	Type	Default Value	Required/Optional	Updatable	LOV, additional information
Run	Button	N/A	N/A	N/A	Initiates process for running Rules. Explained later in this document.
Pagination Options	Icon	Set in Global Preferences	N/A	N/A	Indicates the number of rows to display per page in the summary table.

13.3 Searching for Rules

Search for a business rule to perform any of the following tasks:

- Update, Copy, delete, or run existing rules.
- Define methodologies for products or define other processing assumptions.

To search the Rule, follow these steps:

1. Navigate to the rule summary page for the appropriate rule type.
2. Search for the rule, as follows:
   a. Select the folder in which the rule is stored.
   b. (Optional) Enter the name of the rule.
   c. Click Search.

      Only rules that match the search criteria are displayed.

For more information, see the Overview of Common Rule Management Tasks section.

13.4 Creating Rules

You create a rule to specify the way you want a particular task or business process to be carried out by the application. Creating a rule is a process, in which you specify the properties for the rule itself.

To create a new Rule, perform the following procedure:

1. Navigate to the summary page of the Rule you want to create.
2. Click Add to display the rule definition page.
3. Enter a name for the rule.

   The name of a rule must be unique within the selected folder for each rule type.
4. Select the folder in which you want to store the rule.
5. (Optional) Enter a description for the rule.
6. Select the required access for other users.
7. Click Apply or Save, depending on the rule type.
8. Specify any other properties or options that may apply to the rule that you are creating.

13.5 Viewing and Editing Rules

You can view existing rules, and you can edit existing rules, provided you have read/write privileges.

To view and edit a Rule, perform the following procedure:

1. Navigate to the summary page of the Rule you want to update.
2. Search for a Rule. For further information, see the Searching for Rules section.
3. Select the appropriate rule and click Edit to open the rule you want to update.
   a. Update the Name or Description.
   b. Click Apply or Save, depending on the Rule type.

13.6 Copying Rules

You can copy rules to avoid having to enter data multiple times. This saves time and effort and also reduces mistakes.

To copy a rule, perform the following procedure:

1. Navigate to the summary page of the Rule you want to copy.
2. Search for a Rule. For further information, see the Searching for Rules section.
3. Select the appropriate Rule and click Copy corresponding to the Rule that you want to duplicate.
4. Select a folder.
5. Enter a unique name for the new Rule.
6. (Optional) Enter a brief description for the rule.
7. Select the access type.
8. Click Save.

13.7 Deleting Rules

You can delete rules that are no longer needed.

> **NOTE** Once deleted, a rule cannot be retrieved.

Restrictions on deleting rules are:

- You cannot delete rules if you have only Read privileges. Only users with read/write privilege and rule owners can delete rules.
- You cannot delete a rule that has a dependency.

To delete a Rule, perform the following procedure:

1. Navigate to the summary page of the Rule you want to delete.
2. Search for a Rule. For further information, see the Searching for Rules section.
3. Select the appropriate Rule and click the Delete icon.

For more information, see the Overview of Common Rule Management Tasks section.

13.8 Dependency Checking

You can check dependencies for rules to know where a particular rule, dimension, member, attribute, IRC have been used. Also, this prevents accidental deletion of rules having dependencies.

To check dependency of a Rule, perform the following procedure:

1. Navigate to the summary page of the Rule you want to check dependencies.
2. Search for a Rule. For further information, see the Searching for Rules section.
3. Select the appropriate rule(s) and click check dependencies corresponding to the rule that you want to check for.

   NOTE You can select more than one rule at a time to check dependencies.

   The Dependency Information window opens containing the following information: Child object Name, Child Object Type, Folder, Parent Object Name, Parent Object Type, Folder.

Example 8–1

If a Product Characteristics rule 'A' which has been used in a static deterministic process 'P' is checked for dependencies, then the following information is displayed in the Dependency Information window.

- Child object Name –A
- Child Object Type – Product Characteristics
- Folder – The folder name in which A resides
- Parent Object Name - P
- Parent Object Type – Static Deterministic Process
- Folder - The folder name in which P resides

NOTE

You cannot delete a child object which has dependencies. You will get a message: Dependencies found. Cannot delete.

To delete the child, you must first delete the outermost parent object which uses the child.

14 Cash Flow Edits

This module discusses the procedure for validating and cleansing your Instrument table data before you process it to generate Cash Flow based results.

This chapter covers the following topics:

- Overview of Cash Flow Edit Processes
- Creating Cash Flow Edit Processes
- Executing Cash Flow Edit Processes

14.1 Overview of Cash Flow Edit Processes

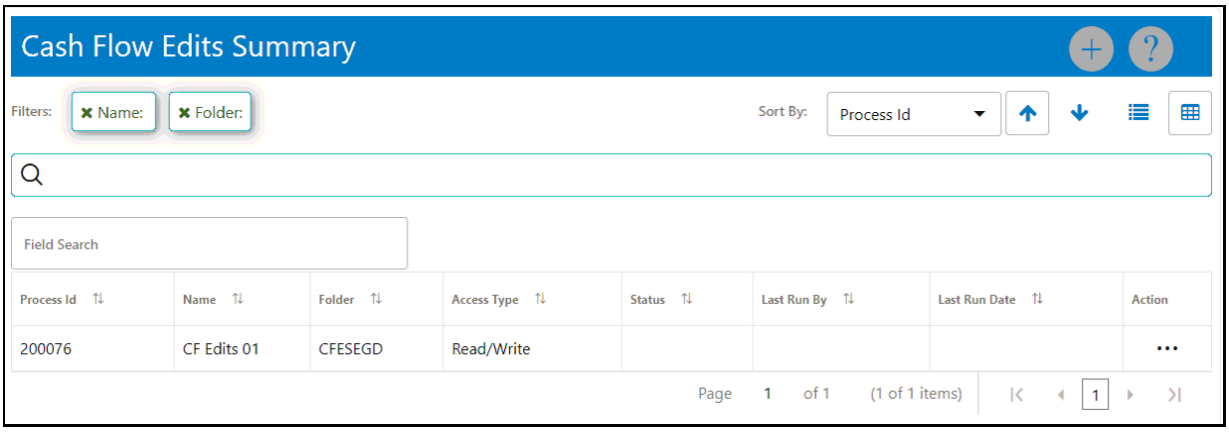
Cash Flow Edit Processes allow you to verify the accuracy and check the completeness of your Instrument table data.

> **NOTE** Cash Flow Edits do not support the Derivatives Tables.

The procedure for working with and managing a Cash Flow Edit Process includes the following steps:

- Searching for Cash Flow Edit processes: For more information, see the Search for Rules Section.
- Creating Cash Flow Edit processes: For more information, see the Create Rules Section.
- Viewing and Editing Cash Flow Edit processes: For more information, see the View and Edit Rules Section.
- Deleting Cash Flow Edit processes: For more information, see the Delete Rules Section.
- Check Dependencies in the Cash Flow Edit Processes.
- Refresh the Cash Flow Edit Summary Page.

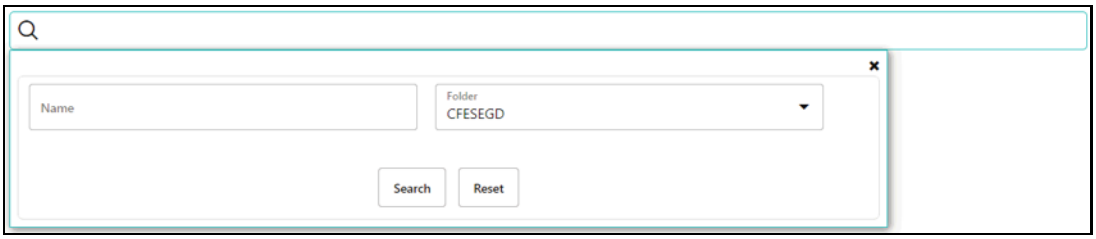
Figure 90: Cash Flow Edit Summary Page



The definitions based on the search criteria are listed under the List of Cash Flow Edits. This is the search section that contains multiple parameters. You can specify one or multiple search criteria in

this section. When you click Search, depending upon the search criteria, this filters and displays the relevant search combination parameters under the Cash Flow Edits Summary as a list.

Figure 91: Search Page



The Cash Flow Edit Summary Window displays the following columns:

- **Process ID**: Displays the Process ID of Cash Flow Edit Rule.
- **Name**: Displays the Cash Flow Edit rule's short name.
- **Folder**: Displays the Folder name where Cash Flow Edit Rule is saved.
- **Access Type**: Displays the access type of rule. It can be Read-Only or Read/Write.
- **Status**: Displays the status of the rule.
- **Last Run By**: Displays the Name of the user who last run the Cash Flow Edit Rule.
- **Last Run Date**: Displays the Date and Time when Cash Flow Edit was run last.
- **Action**: Displays the list of actions that can be performed on the Cash Flow Edit Rule. For more information, see Cash Flow Edit Rule – Icons and Descriptions.

The Action column on Cash Flow Edits Summary Page offers several actions that allow you to perform different functions. The following actions are available for the Cash Flow Edit Rule.

- **Add**: Click the Add icon to build a new Cash Flow Edit Rule.
- **View**: Click ••• in the Action column and select View/Edit to view or edit the contents of a Cash Flow Edit Rule in read/write format.
- **Save As**: Click ••• in the Action column and select Save As to create a copy of an existing Cash Flow Edit Rule.
- **Delete**: Click ••• in the Action column and select Delete to delete an existing Cash Flow Edit Rule.
- **Execute**: Click ••• in the Action column and select Execute to execute an existing Cash Flow Edit Rule.

  After clicking Execute, the Run Parameter Execution window is displayed. Select As of Date (Execution Date) and Legal Entity, and then click Run. For more information, see the Executing Cash Flow Edit Processes Section.
- **Execute Details**: Click ••• in the Action column and select Execute Details to view execution details of the Cash Flow Edit Rule.

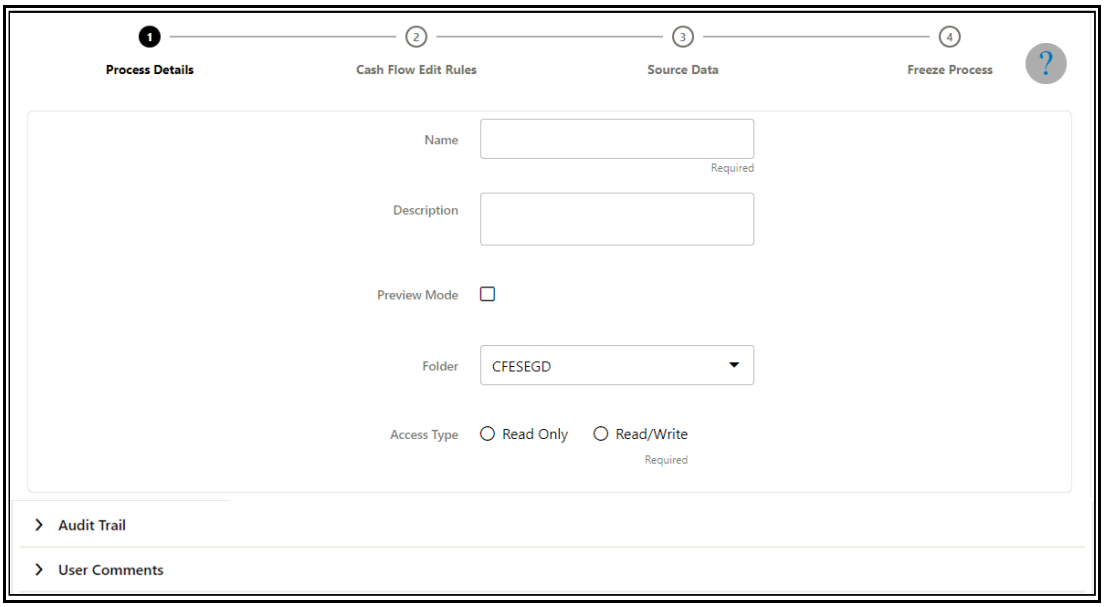
You must create and run Cash Flow Edit Processes on your Instrument table data before you submit Cash Flow Engine-based rules for processing.

14.2 Creating Cash Flow Edit Process

Creating a Cash Flow Edit Process is a one-step process. You define both the attributes that uniquely describe a particular Cash Flow Edit Process and the data to be validated or cleansed by that process on the Create Cash Flow Edit Process Page.

1. Navigate to the **Cash Flow Edits Summary** Page.
2. Click **Add**. The **Create Cash Flow Edits Process** Page is displayed.

Figure 92: Cash Flow Edit Process of CFE Processing

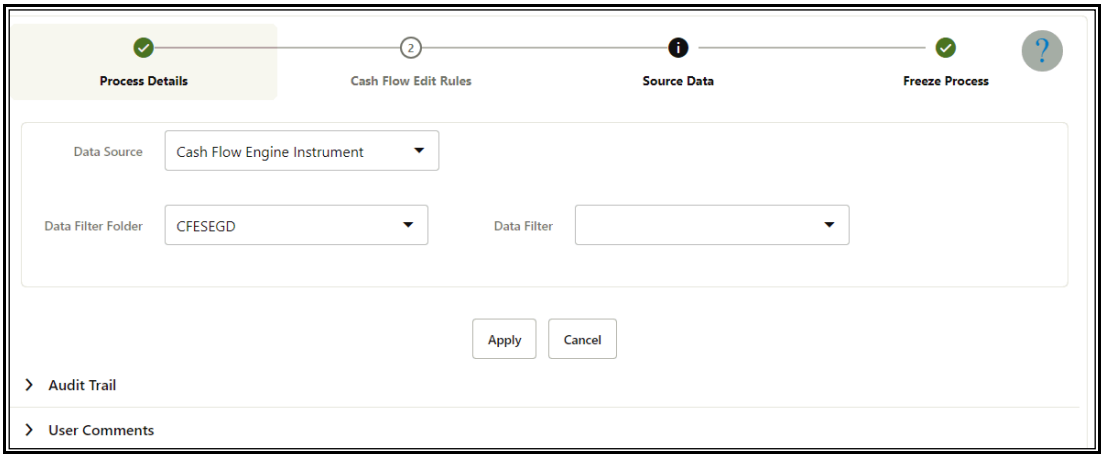


3. Enter the following process details:
   - **Name**: Enter the name of the Cash Flow Edit Rule.
   - **Description**: Enter the description of the Cash Flow Edit Rule.
   - **Preview Mode**: Selecting this parameter allows you to view the results of running a Cash Flow Edit Process before the system updates the underlying records in the Instrument tables. The default value of this parameter is checked.
   - **Folder**: Enter the Folder details where Cash Flow Edit Rule needs to be saved.
   - **Access Type**: Select the Access Type as Read-Only or Read/Write.
4. Click **Apply** to navigate to Cash Flow Edit Rules Section.

Figure 93: Cash Flow Edit Rules

5. Enter the following Cash Flow Edit details:
   - **Group**: Select the group of Instrument tables of Cash Flow Edit Rule that you want to include in the Cash Flow Edit process. For example, Cash Flow.
   - **Sub-Group**: Select the Instrument table of Cash Flow Edit Rule that you want to include in the Cash Flow Edit process. The value of this field varies based on the selected Group. The list of Rule IDs with conditions is displayed.
6. Click **Apply** to navigate to the Source Data Section.

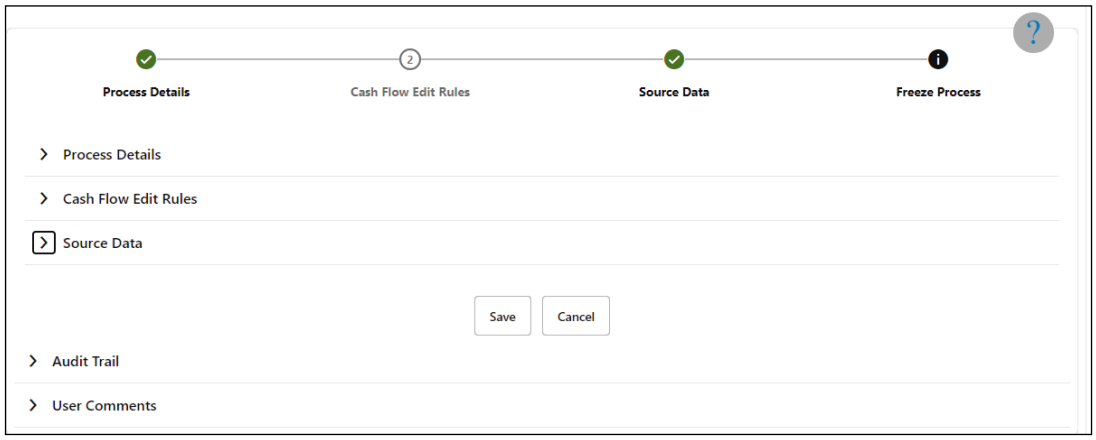
Figure 94: Source Data Tab



7. Enter the following Source Data details:
   - **Data Source**: This field allows you to select the Instrument tables that must be included in a Cash Flow Edit Process.
   - **Data Filter Folder**: Select the Data Filter Folder.
   - **Data Filter**: This field allows you to select a subset of data for processing by selecting a Filter that was previously created.

8. Click Apply to navigate to the Freeze Process section. Click Save on the Freeze Process Window after verifying all the details.

Figure 95: Freeze Process Tab



The Cash Flow Edits process is saved and the Summary Page is displayed.

14.3 Executing Cash Flow Edit Process

Execute a Cash Flow Edit process to check the accuracy and the completeness of your Instrument table data. When run in Preview Mode, you can view the results of running a Cash Flow Edits process by querying the FSI_PROCESS_ERRORS table for generated errors before the system updates the underlying records in the Instrument tables.

The following list describes the key terms used for this procedure:

You can execute the Cash Flow Edit process using the following methods:

- Cash Flow Edit UI
- Batch Maintenance

14.3.1 Using Cash Flow UI

To execute the cash flow edits process, follow these steps:

1. Navigate to the **Cash Flow Edits Summary** Page.
2. Search for a rule.
3. Click in the **Action** column and select **Execute** to execute an existing Cash Flow Edit Rule. The Run Parameter Execution Window is displayed.
4. Select the As of Date (Execution Date) and Legal Entity, and then click Run.

   The **Cash Flow Edits Run Confirmation** Page is displayed. The status of the process is displayed in the Status column. After completion of the process, you can navigate to the Execution Details Page by selecting the Execution Details option under the Action Column.

NOTE You can view the results of running a Cash Flow Edits Rule before the system updates the underlying records in the Instrument tables, provided you selected Preview Mode while defining it. If the rule runs in Preview Mode, query the FSI_CFE_MESSAGES_MLS table for any generated errors.

14.3.2 Batch Based Procedure

Cash Flow Edit Processes can also be executed as Batch Processes. The following approaches are available:

- Simplified Batch
- ICC Batch
- Run Rule Framework

14.3.2.1 Simplified Batch

To execute the batch with Simplified Batch, follow these steps:

1. From the LHS menu, select **Financial Services Applications**, select **Administration**, and then select **Simplified Batch**.
2. Create a New Simplified Batch.
3. Select Task Type as Transform Data.
4. Select Historical Prepayment Batch from the list of Seeded Process types.
5. Input the following in the Optional Parameters text box:

   'Prepaid Detection Process System ID','User ID', for example, '200883','TPUSER'
6. Save the rule and Execute.

14.3.2.2 ICC Batch

To execute the batch with ICC Batch, follow these steps:

1. From the LHS menu, select **Financial Services Applications**, select **Operations**, and then select **Batch Maintenance**.
2. Create a new batch.
3. Enter the Batch Name and Description.
4. To add a task, click the Add button under the Task Details Section.
5. Define the Task ID and Description.
6. Select Components as “WORKFLOW_EXECUTION”.
7. Do not change the default values populated for the following fields:
   - Datastore Type
   - Datastore Name

- Primary IP for Runtime processes.

8. Input the following required parameters:
   - Object ID: $objectId
   - Workflow: “CASH_FLOW_PROCESS_EXEC” or "Cash_FLOW_EDITS_PROCESS_EXEC"
   - Optional Parameters: “RUN_P1_DATE:EXECDATE,RUN_P2_INFODOM:OFSCFEINFO,RUN_P3_ID:200023,RUN_P4_USERID:CFEUSER,RUN_P5_DATE_FORMAT:yyyyMMdd,RUN_P6_AS_OF_DATE:EXECDATE,RUN_P7_LEGAL_ENTITY_ID:-1”.

   The value for parameter “RUN_P3_ID” should be taken from column “PROCESS_ID” of table “FSI_M_CFE_PROCESS_DETAILS” for Cash Flow Process OR column “PROCESS_ID” of table "FSI_M_CFE_EDITS_DETAILS" for Cash Flow Edits. Replace the value 200023 given against “RUN_P3_ID” with the value available in the table for the respective Business Definition.

   Replace the value CFEUSER given against “RUN_P4_USERID” with the logged-in user id which will be used to audit the last executed by.

   Replace the value -1 given against “RUN_P7_LEGAL_ENTITY_ID” with the actual Legal Entity ID to process the instruments.

9. Save the rule and Execute the Batch with Batch ID and MIS Date.

14.3.2.3 Run Rule Framework

To execute the batch with Run Rule Framework, follow these steps:

1. From the LHS menu, select **Financial Services Applications**, select **Manage Runs**, and then select **Process**.
2. Create a new rule.
3. Define the Folder, Code, and Name of rule.
4. Select the Component as Transform Data.
5. Select Historical Prepayment Batch from the list of seeded process types.
6. Input the following required parameters:
   - Prepaid Detection Process System ID
   - User Name

   These parameters must be given in the following format (sys Id, User Id), for example, 101000, TPUSER.
7. Save the rule and Execute.

14.3.3 View Cash Flow Edit Process Log

To view the cash flow edit errors, warnings, and info, navigate to the ftpshare/logs folder and view the CashFlowEditsProcessExecution.log file.

You can view the log using Batch Monitor also. To view the logs from Batch Monitor, follow these steps:

1. Navigate to **Common Object Maintenance**, select **Operations**, and then select **Batch Monitor**.
2. Select the **Batch Run ID**.
3. View the Task Details of CashFlowEditsExecution.
4. Click **View Log**.

14.3.4 Cash Flow Edit Process Errors

The following are the errors, warnings, or information messages displayed by the Cash Flow Edit Process.

NOTE

- Error: Engine does not process, however sometimes the default value can get used for calculations.
- Warning: Engine may use the default value or given wrong data for calculation, results may be incorrect.
- Info: Does not impact any processing but results may not be as expected.

15 User-Defined Behavior Patterns

User-defined behavior patterns allow you to define principal amortization schedules and replicating portfolio characteristics for non-maturity products in your portfolio. You can utilize a behavior pattern while generating cash flows (for use in ALM and Liquidity Risk Management) by entering the behavior pattern code as the amortization type code (AMRT_TYPE_CD) for the relevant instrument records. In Funds Transfer Pricing, for certain TP Methods, you can select a Behavior Pattern to support your Transfer Pricing assumptions.

In many cases, particularly for ALM processing, the "non-maturity" instruments will be aggregated or summarized balances.

The Behavior Pattern codes can range from 70000 to 99999.

15.1 Creating Behavior Patterns

Depending on the Transfer Pricing method, the Behavior Pattern mapped to the individual instrument records (amrt_type_cd), may or may not be used. For cash flow TP methods, the engine will read the Behavior Pattern from the instrument record. For the Tractor, Caterpillar, and Weighted Average Perpetual methods, the Behavior Pattern is assigned directly within the TP Rule at a Product / Currency level and hence, the TP engine will not refer to the Behavior Pattern assigned to the individual instrument records for these methods.

The procedure for working with and managing Behavior Patterns is similar to that of other Oracle Funds Transfer Pricing assumption rules. It includes the following steps:

- Searching for Behavior Pattern
- Creating a Behavior Pattern
- Viewing and Editing Behavior Patterns
- Copying Behavior Patterns
- Deleting Behavior Patterns

15.1.1 Search for Behavior Patterns

Search for a behavior pattern to perform any of the following tasks:

- View
- Edit
- Copy
- Delete
- Check Dependencies

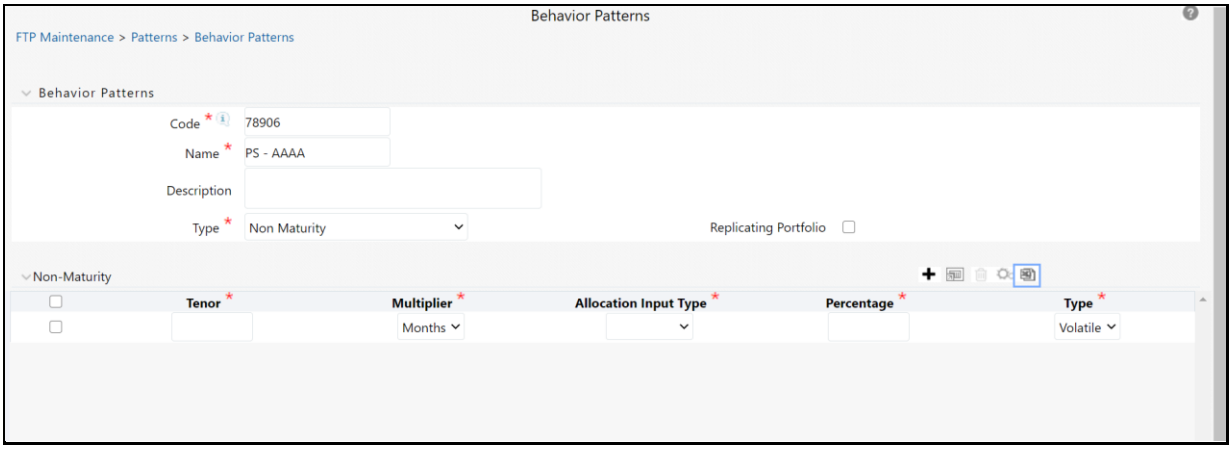
15.1.2 Create Behavior Patterns

You create behavior patterns to capture the principal run-off behavior of product types that do not have contractual maturities.

To create a behavior pattern, do the following:

1. Navigate to the Behavior Pattern summary page.
2. Click the **Add** icon to display the **Behavior Pattern Details** page.

Figure 96: Behavior Patterns Details page



3. Enter a **Code** for the new behavior pattern.

> **NOTE** The code, also known as an amortization type code, is a numeric identifier for the behavior pattern. The code value must be a number between 70000 and 99999. The code value you assign to the new pattern must be unique. Also, the code must be mapped to the appropriate instrument records, (AMRT_TYPE_CD field) to connect the instrument to the appropriate pattern.

4. Enter the **Name** and a **Description** for the pattern.
5. Select the **Behavior Pattern Type** from the following options:
   - Non Maturity
   - Non Performing
   - Devolvement and Recovery.
   - Enter a **Code** for the new behavior pattern.

> **NOTE** The Replicating Portfolio option is enabled only for the Non-Maturity Behavior Pattern. This option should be selected only when defining a Behavior Pattern for use in Funds Transfer Pricing – Tractor TP Method. Replicating Portfolio Behavior Pattern codes should not be mapped to instrument records (amrt_type_cd) and will not be available for selection in any UI other than Tractor TP Method.

6. Define the Behavior Pattern Term Specifications for maturity tranches.

7. The selection of the Behavior Pattern type made in the previous step determines the information you must provide to successfully define that pattern type. See:
   - Defining Non-Maturity Behavior Patterns (for non-Tractor TP Method use)
   - Defining Non-Maturity Behavior Patterns (for Tractor TP Method use)
   - Defining Non-Performing Behavior Patterns

> **NOTE** The Behavior Pattern details page displays the specifications associated with the Non-Maturity Pattern Type. Should you change this value for one of the other two alternatives, Non Performing or Devolvement and Recovery, the system will refresh the payment specifications section corresponding to the new Pattern Type. Although you can change your selection of the Pattern Type at any point in this procedure, sometimes this might result in loss of data related to any prior selection.

15.1.3 Defining Non-Maturity Behavior Patterns (for non-Tractor TP Method use)

Non Maturity behavior patterns are commonly used for deposit products like checking, savings, and money market accounts as well as for credit card accounts. These account types are similar in that they do not have contractual cash flows because customers have the option to deposit or withdraw any amount at any time (up to any established limits).

When working with non-maturity behavior patterns, your percentage weights, assigned to maturity terms must add up to 100%.

To define a non-maturity behavior pattern for the non-Tractor TP method, follow these steps:

1. In the Behavior Pattern details page, select Non Maturity as the Behavior Pattern Type.
2. Enter or select the following details:
   - **Tenor**: Used to specify the maturity term for the particular row. For example, if “1 Day” is defined, then the applicable percentage of the balance will runoff (mature) on the As of Date + 1 Day.
   - **Multiplier**: The unit of time applied to the Tenor. The choices are:
     - Days
     - Months
     - Years
   - **Percentage**: The outstanding balance indicating how much of the outstanding balance will mature on the specified term.
   - **Allocation Input Type**: This field allows you to select the Amount or Percentage when defining the volume for each maturity tier.
   - **Type**: This allows you to classify the runoff based on the appropriate type. If you select Percentage under 'Allocation Input Type', this allows you to select Core or Volatile. When

Amount 'Allocation Input Type' is selected, only Core amounts are allowed to be entered. The TP engine calculates the Volatile amount internally based on the sum of the portfolio balance less than the sum of the core amounts. That is 100% of the portfolio balance is accounted for as either core or volatile.

> **NOTE** There is no difference in behavior from a cash flow perspective, but the runoff amount will be written to a principal runoff financial element corresponding to the selected Runoff Type.

3. Click the **Add** icon to add additional payment strips to the Pattern. After defining the initial strip as Volatile, subsequent strips are classified as Core with varying maturity terms assigned.
4. To delete a row, select the check box corresponding to the row you want to remove and click the **Delete** icon.
5. Click **Save**.

The Behavior Pattern is saved and the Behavior Pattern summary page is displayed.

15.1.4 Defining Non-Maturity Behavior Patterns (for Tractor TP Method use)

The Tractor Transfer Pricing Method utilizes a replicating portfolio concept. Replicating portfolios are a special type of Non-Maturity Behavior Pattern and are created and managed through the Non-Maturity Behavior Pattern UI.

Through the replicating portfolio UI, users can define one or more core balance amounts. Users assign a term to each core and generate balance strips at any granularity (for example, daily or monthly, depending on the frequency of the transfer pricing process). To maintain the portfolio over time, users must roll and re-balance the portfolio to update the volatile plug amount and if needed re-balance the core amount.

Update the Balance type when the source table is the instrument table. The Balance type allows you to select the type of Balance.

- If the Source is selected as “Management Ledger, then it can be either Average Balance or Ending Balance.
- If the source is selected as either “Instrument” or Aggregate Table”, then it can be Cur Book, Cur Par, or Average balance.

To define a non-maturity behavior pattern for Tractor TP method use, follow these steps:

1. In the Behavior Pattern details page, select Non Maturity as the Behavior Pattern Type.
2. Enter or select the following details:

   This table describes the key terms used for this procedure.

Table 8: Key Terms used in the Behavior Pattern Details page

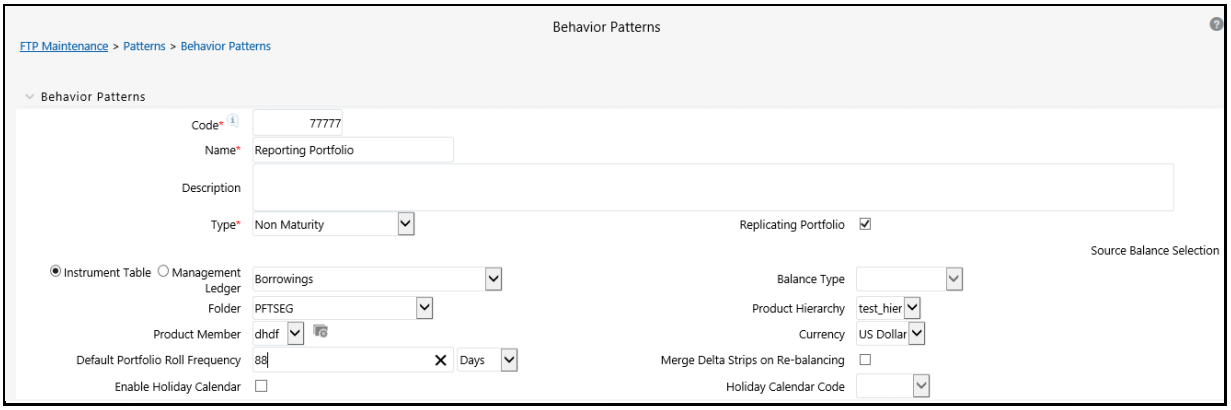
Term	Description
Core Allocation Input	This drop-down is a mandatory selection. The drop-down values are the Amount and Percentage.
Core Allocation	The amount that is apportioned to each core. The Allocation amount in absolute or percentage for each strip is automatically determined (when Strip Tenor is "Days", or "Months") by evenly spreading the defined Core Amount across the number of strips for the portfolio. When Strip Tenor is "At Maturity", the entire amount is placed at the maximum term, determined by the inputs for "Term" and "Multiplier". If the user selects 'Amount' in the Core Allocation Input drop-down list, then the 'Core Allocation' text box accepts values from 0.0000 to 9,999,999,999.9999. If the user selects 'Percentage' in the Core Allocation Input drop-down list, then the 'Core Allocation' text box accepts only a percentage value between 0.0000 and 100.0000.
Tenor	Used to specify the maturity term for the portfolio. This term defines the maximum term for the initial strip balance and the rollover term for each rollover strip. When you manually select or schedule the replicating portfolio process, the Org term of the volatile strip is calculated. Replicating Portfolio generates the volatile strips that set the ORG_TERM equal to the Period between Maturity date and Origination date.
Multiplier	The unit of time applied to the Tenor. The choices are: • Days • Months • Years
Type	For replicating portfolio, the type is defaulted to the core. The Volatile strip is generated automatically as a reconciling plug entry to balance the portfolio. The term of the plug entry is defaulted to 1 Day unless a holiday calendar is used, in which case the volatile amount maturity can be extended to the next business day.
Strip Tenor	Indicates the frequency of the strips generated for the portfolio. Available options are "Days", "Months" or "At Maturity". For example, if "Days" is selected, strips will be generated for each day from the as-of-date to the maturity term. If "At Maturity" is selected, a single strip will be generated and the balance will be placed at the maturity term.
Source Balance Selection	The source balance selection allows you to define the source Instrument Table, Aggregate table (or Ledger Table).
Data Filter	Along with product and currency, the Data Filter allows you to define the portfolio at a more granular level.
Balance Type	The Balance type allows you to select the type of Balance. It can be either Average Balance or Ending Balance. This option will be enabled if the Source Balance is selected as *Management Ledger*.
Enable Holiday Calendar	Replicating Portfolio's allow users to enable a holiday calendar. If this option is selected, portfolio strips will not be generated on weekends or holidays. Also, during rollover of maturing strips new maturity dates will be adjusted to ensure maturities fall only on working days.
Holiday Calendar Code	The holiday calendar code allows users to select the applicable holiday calendar.

Term	Description
Holiday Calendar Rolling Convention	The rolling convention within replicating portfolios is defaulted to the next business day. Related to this method is an additional date adjustment to ensure that only one core strip falls on a single date. We refer to this secondary adjustment as an exclusive business day convention.
Default Portfolio Roll Frequency	The default portfolio roll frequency option allows you to set the default rolling frequency of the replicating portfolio.
Merge Delta Strips on Re-balancing	If Merge Delta Strips on the Re-balancing option is enabled, then the core strips will be merged during the rebalancing.
Generate the Portfolio	After initially creating (and saving) the replicating portfolio definition, users should Generate the Portfolio. This action launches a background process that generates the strip records for the portfolio. Before running this process be mindful of the As-of-date defined in your Application Preferences, as this date will be used as the initial Origination Date for the newly created strips. If % is selected as the Core Allocation Input type, the procedure will read the current period balance (CUR_BOOK_BAL or Ending Balance), for the selected "Product Member" (from Source Balance selection) and determine the Required Core Amount based on the resulting Balance x Core %. This applies to both Management Ledger (Ending Balance) and Instrument table (CUR_BOOK_BAL).
Roll the Portfolio Forward	Each period (day or month), users will need to roll the portfolio forward. The new as-of-date for the portfolio will be determined based on the existing as-of-date plus the default roll frequency. As a general rule, users should update their as-of-date application preferences before running the Roll Portfolio Process.
Roll the Portfolio Backwards	This option allows you to roll back the portfolio to the initially selected as of date.
Roll Back	If you have rolled the portfolio forward by mistake and needed to roll the portfolio back to its original state, click the Roll Back button. This will first take your confirmation on the rolled backdate based on the rolled forward as of date minus the default roll frequency. All the original strips and corresponding tenors will be restored to the original state.
Re-balance the Portfolio	After rolling the portfolio, users will need to re-balance the portfolio. There are two options provided for re-balancing: • **Plug to Volatile Strip**: This option should be selected when no changes to the core allocation are made. This process will compare the current period source balance with the current portfolio strip balance. The difference will be posted to the new volatile strip. The "Plug to Volatile Strip" Re-balance method will not be relevant when the Core input type is % as the portfolio balance will change with every new as-of-date and new balancing/delta strips will be required to re-balance the portfolio. • **Rebalance Core Strips**: This option should be selected only when users have modified the Core Allocation or when the Core input type is %. If the Core Allocation has increased or decreased, balancing strips will be generated for each tenor to bring the core strip balance back in line with the Core Allocation Balance. This process will additionally run the Plug to Volatile process to create the plug strip.
View the Portfolio	This option allows you to view the portfolio strips.

This table describes various fields on the Behavior Pattern Details page. You can enter or select the relevant details to populate the screen to define the Non-maturity Behavior Patterns for the Tractor TP Method use.

3. Make your required selections in the **Source Balance Selection** section.
4. Select the **Balance Type** based on the Source selected.
5. Click **Add Core** (one or more) to input the core amount, associated maturity term, and strip frequency.
6. To delete a row, select the check box corresponding to the row you want to remove and click the **Delete** icon.
7. Click **Save**.

Figure 97: Behavior Pattern Summary page



The Behavior Pattern is saved and the Behavior Pattern summary page is displayed.

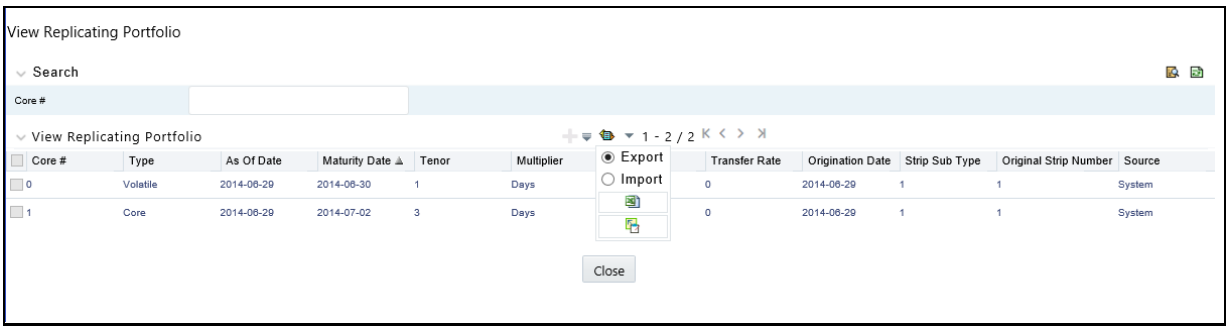
8. Return to the Behavior Pattern/Replicating Portfolio in EDIT mode and execute the portfolio maintenance activities, including:
   - Generate Portfolio
   - Roll Portfolio
   - Rebalance Portfolio
   - View Portfolio

> **NOTE** After the Replicating Portfolio is generated and the volatile plug has been updated for the current period, it is ready for processing by the FTP Engine. FTP Processes utilizing the Tractor TP Method should not be run until all Replicating portfolios are updated.

15.2 Export and Import Replicating Portfolio Data in Excel

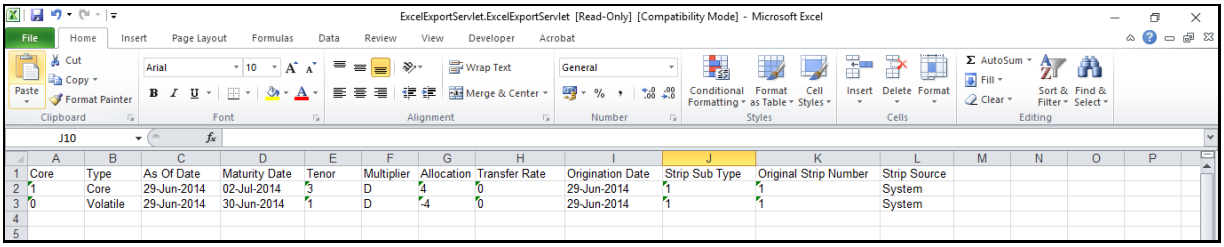
There is an option through the Replicating Portfolio > View Portfolio UI to manually edit existing portfolio strips through Export and Import of the active Strip Data. The following screenshot illustrates the functionality:

Figure 98: Replicating Portfolio Viewing page with collapsed Excel options



- The Export option works against the entire active portfolio. For example, a user can currently filter on a specific CORE # or look at results for all Cores. Additionally, the selection of Strips can span multiple pages, for example - as seen in the preceding screenshot, 1-20 of 71. In this example, all 71 active strips are exported to Excel.
- The import function will replace ALL existing “Active” strips.
- The strip data being imported is validated to confirm that all required data is included. If the data is not complete, for example, it does not provide information for Core #, Strip Type, As of Date, Maturity Date, Tenor, Multiplier, Allocation (or Amount), then a warning message is given indicating that “The selected data is incomplete and cannot be imported. Please re-check the data and try again.” The portfolio can also be edited directly on the view portfolio screen after new strips are imported.
- When you click the Strip Source option, the status column in the summary table shows the tagged strip records that are created by the system or manually. You can edit these tags for strips that are manually created or existing strips after exporting them into Excel.

Figure 99: Exported Data in Excel



15.2.1 Scheduling Replicating Portfolio Actions

In addition to using the “Roll Portfolio” and “Re-balance Portfolio” button options in the Replicating Portfolio UI or the “Merge Portfolio” option, users can batch and schedule these functions through a Simplified Batch or ICC Batch process.

There are three seeded tasks listed under the Transform Data task type for scheduling these actions:

- Roll_Portfolio
- Rebalance_Portfolio
- Merge_Portfolio

The following parameters are required for each task:

Roll Portfolio:

- **Run ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Process ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Execution ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Run Surrogate Key**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Pattern Code**: for example, '70001'
- **Application ID**: for example, 'TP' (this is a static value)
- **FTP User**: for example, 'TP USER 1'

  These parameters would appear as follows in the simplified batch parameter input block:

  '','','','','70001','TP','TP USER 1'

  When executing from the Run Rule Framework, the user does not have to pass the Run ID, Process ID, Execution ID, and Run Surrogate Key, as the framework itself passes these values along with the Batch ID and MISDATE. The parameters would appear as follows:

  "70001","TP","TP USER 1"

Re-balance Portfolio:

- **Run ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Process ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Execution ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Run Surrogate Key**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Pattern Code**: for example, '70001'
- **Re-balance type**: for example, '1' (plug to volatile) or '2' (rebalance core strips)
- **FTP User**: for example, 'TP USER 1'
- **Application ID**: for example, 'TP' (this is a static value)

  These parameters would appear as follows in the simplified batch parameter input block:

  '','','','', '70001', '1', 'TP USER 1', 'TP'

When executing from the Run Rule Framework, the user does not have to pass the Run ID, Process ID, Execution ID, and Run Surrogate Key, as the framework itself passes these values along with the Batch ID and MISDATE. The parameters would appear as follows:

"70001","1","TP USER 1","TP"

Merge Portfolio:

- **Run ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Process ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Execution ID**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Run Surrogate Key**: when running via ICC batch and Simplified batch process, this parameter can be passed as ''
- **Pattern Code**: for example, '70001'
- FTP User: for example, 'TP USER 1'
- Application ID: for example, 'TP' (this is a static value)

When to merge (roll versus rebalance): when running via ICC batch and Simplified batch process, this parameter should always be 'N'

Maturity date identifying maturing strips to be merged on roll: when running via ICC batch and Simplified batch process, this parameter should always be ''

These parameters would appear as follows in the simplified batch parameter input block:

'','','','','70001', 'TP USER 1', 'TP', 'N', ''

When executing from the Run Rule Framework, the user does not have to pass the Run ID, Process ID, Execution ID, and Run Surrogate Key, as the framework itself passes these values along with the Batch ID and MISDATE. The parameters would appear as follows:

"70001","TP USER 1","TP","N",""

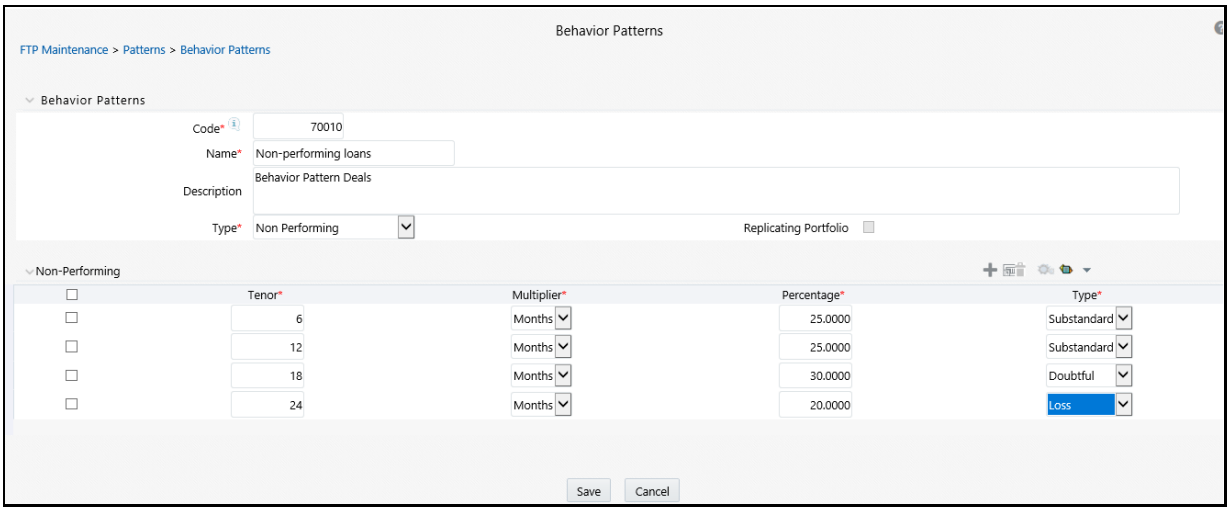
15.3 Defining Non-Performing Behavior Patterns

Non Performing behavior patterns are commonly used for balances that are classified as non-earning assets. These balances are sourced from the management ledger as aggregate balances. Users can assign expected maturity profiles to these balances classifying them into appropriate categories of Sub Standard, Doubtful, or Loss.

To define the non-performing behavior patterns, follow these steps:

1. On the Behavior Pattern details page, select Non Performing as the Behavior Pattern Type.
2. Enter the **Code, Name**, and **Description** for the Behavior Pattern.
3. Click the **Add** icon to open the **Non-Performing Behavior Patterns** summary page.

Figure 100: Behavior Pattern with Type as Non-Performing



4. Enter or select the following details:
   - **Tenor**: Specify the maturity tenor for the first maturity strip. For example, if "1 Day" is defined, then the applicable percentage of the balance will runoff (mature) on the As of Date + 1 Day.
   - **Multiplier**: The unit of time applied to the Tenor. The choices are:
     - Days
     - Months
     - Years
   - **Percentage**: The relative amount of the principal balance that will mature on the date specified by the Tenor + Multiplier. The percentage amounts can exceed 100% for non-performing patterns.
   - **Runoff Type**: This allows you to classify the runoff based on the appropriate type. The options are:
     - Substandard
     - Doubtful
     - Loss

> **NOTE** There is no difference in behavior from a cash flow perspective, but the runoff amount will be written to a principal runoff financial element corresponding to the selected Runoff Type.

5. Click the **Add** icon to add additional payment strips to the Pattern and define appropriate assumptions for each strip.
6. To delete a row, select the check box corresponding to the row(s) you want to remove and click the **Delete** icon.
7. Click **Save**.

The Behavior Pattern is saved and the Behavior Pattern summary page is displayed.

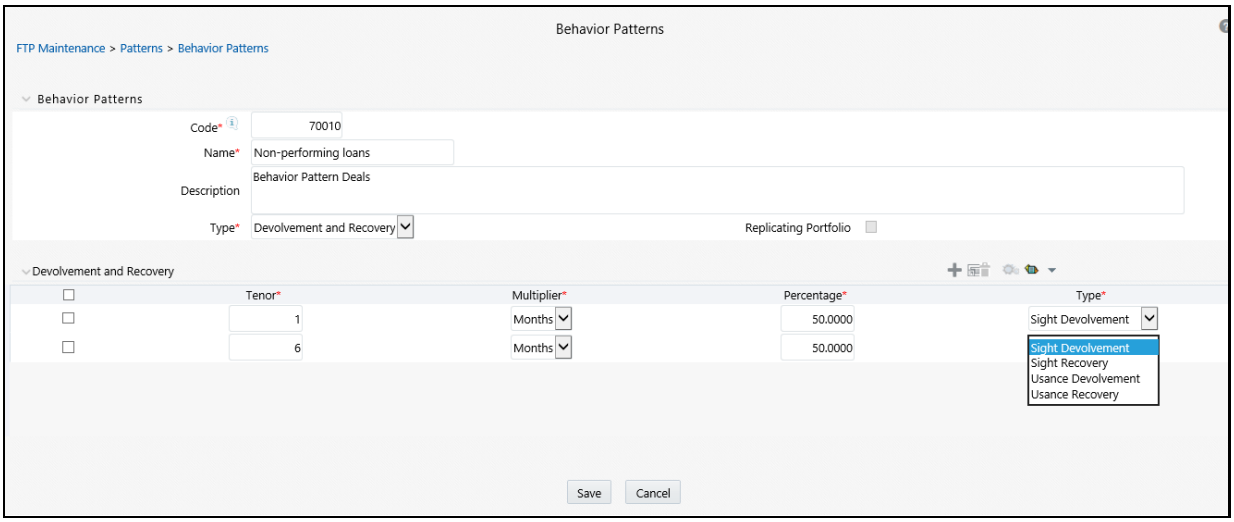
15.4 Defining Devolvement and Recovery Behavior Patterns

Devolvement and Recovery behavior patterns are commonly used for estimating cash flows associated with Letters of Credit and Guarantees. These product types are categorized as off-balance-sheet accounts. Users can assign expected maturity profiles to the related balances classifying them into appropriate categories of Sight Devolvement and Sight Recovery or Usance Devolvement and Usance Recovery. Sight Devolvement and Recovery are the most common types.

To define the non-performing behavior patterns, follow these steps:

1. On the Behavior Pattern details page, select Devolvement and Recovery as the Behavior Pattern Type.
2. Enter the Code, Name, and Description for the Behavior Pattern.
3. Click the Add icon to open the Non-Performing Behavior Patterns summary page.

Figure 101: Behavior Pattern with Type as Devolvement and Recovery



4. Enter or select the following details:
   - **Tenor**: Specify the maturity tenor for the first maturity strip. For example, if "1 Day" is defined, then the applicable percentage of the balance will runoff (mature) on the As of Date + 1 Day.
   - **Multiplier**: The unit of time applied to the Tenor. The choices are:
     - Days
     - Months
     - Years
   - **Percentage**: The relative amount of the principal balance that will mature on the date specified by the Tenor + Multiplier. The percentage amounts can exceed 100% for devolvement and recovery patterns.
   - **Runoff Type**: This allows you to classify the runoff based on the appropriate type. The options are:

- **Sight Devolvement**: indicates the Beneficiary is paid as soon as the Paying Bank has determined that all necessary documents are in order. This is the preferred approach.
- **Sight Recovery**
- **Usance**: is a period which can be between 30 and 180 days after the bill of lading date.
- **Usance Recovery**

> **NOTE** There is no difference in behavior from a cash flow perspective, but the runoff amount will be written to a principal runoff financial element corresponding to the selected Runoff Type.

5. Click the **Add** icon to add additional payment strips to the Pattern and define appropriate assumptions for each strip.
6. To delete a row, select the check box corresponding to the row(s) you want to remove and click the **Delete** icon
7. Click **Save**.

The Behavior Pattern is saved and the Behavior Pattern summary page is displayed.

This release includes a facility that enables the automatic load of behavior patterns. There is a Behavior Pattern Loader Utility that helps to automatically load model output records from STG_BEHAVIOUR_PATTERN into FSI_BEHAVIOUR_PATTERN_MASTER and FSI_BEHAVIOUR_PATTERN_DETAIL. The utility first performs a sanity check on all records as per business requirements and only moves records that pass these checks. In the case of non-maturing behavior patterns, only non-replicating portfolio patterns can be loaded through this utility. For more information, see the OFS Data Model Utilities User Guide.

16 User-Defined Payment Patterns

User-defined payment patterns allow you to define custom repayment patterns for products in your portfolio. You can include a payment pattern while generating cash flows by entering the payment pattern code as the amortization type code for the instrument. The Payment Pattern code can range from 1000 to 69999.

This chapter describes the procedure for capturing instrument payment patterns that are too complex to be accommodated in the standard fields of Instrument tables.

The procedure for working with and managing Payment Patterns is, similar to that of other Oracle Funds Transfer Pricing assumption rules. It includes the following steps:

- Searching for Payment Pattern
- Creating Payment Patterns
- Viewing and Editing Payment Patterns
- Copying Payment Patterns
- Deleting Payment Patterns

16.1 Search for Payment Patterns

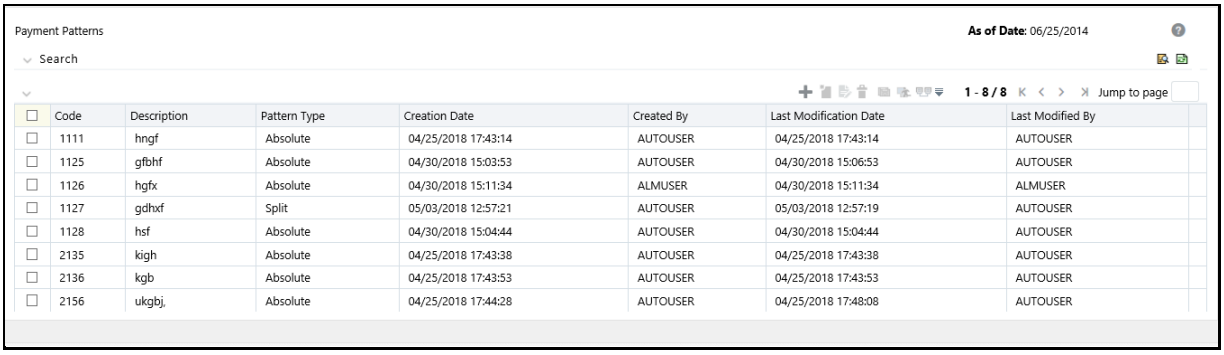
Search for a payment pattern to perform any of the following tasks:

- View
- Edit
- Copy
- Delete
- Check Dependencies

To search for payment patterns, do the following:

1. Navigate to the Payment Pattern summary page. This page is the gateway to all payment patterns and related functionality. You can navigate to other pages relating to payment patterns from this page.

Figure 102: Payment Patterns Summary page



Code	Description	Pattern Type	Creation Date	Created By	Last Modification Date	Last Modified By
1111	hngf	Absolute	04/25/2018 17:43:14	AUTOUSER	04/25/2018 17:43:14	AUTOUSER
1125	gfbhf	Absolute	04/30/2018 15:03:53	AUTOUSER	04/30/2018 15:06:53	AUTOUSER
1126	hgfx	Absolute	04/30/2018 15:11:34	ALMUSER	04/30/2018 15:11:34	ALMUSER
1127	gdhxf	Split	05/03/2018 12:57:21	AUTOUSER	05/03/2018 12:57:19	AUTOUSER
1128	hsf	Absolute	04/30/2018 15:04:44	AUTOUSER	04/30/2018 15:04:44	AUTOUSER
2135	kigh	Absolute	04/25/2018 17:43:38	AUTOUSER	04/25/2018 17:43:38	AUTOUSER
2136	kgb	Absolute	04/25/2018 17:43:53	AUTOUSER	04/25/2018 17:43:53	AUTOUSER
2156	ukgbj,	Absolute	04/25/2018 17:44:28	AUTOUSER	04/25/2018 17:48:08	AUTOUSER

2. Enter the Search criteria.

- Code or description of the Pattern

3. Click the **Search** icon.

   Only patterns that match the search criteria are displayed.

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

16.2 Create Payment Patterns

You create payment patterns to capture the repayment behavior of instruments that are too complex to be accommodated through the use of the standard instrument table fields.

To create the payment pattern, do the following:

1. Navigate to the Payment Pattern summary page.
2. Click the **Add** icon.

   The Add Payment Pattern page is displayed.
3. Enter a code value for the new payment pattern.

> **NOTE** The code, also known as an amortization type code, is a numeric internal identifier for the payment pattern. The code value must be a number between 1000 and 69999. The code value you assign to the new pattern must be unique. Also, the code must be mapped to the appropriate instrument records (AMRT_TYPE_CD field) to connect the instrument to the appropriate pattern.

4. Enter a brief description of the pattern.
5. Select the Payment Pattern Type:
   - Absolute
   - Relative
   - Split.
6. Define the Payment Pattern Term Specifications for payment phases.

   The selection of the payment pattern type made in the previous step determines the information you must provide to successfully define that pattern type. See:
   - Defining Absolute Payment Patterns
   - Defining Relative Payment Patterns
   - Defining Split Payment Patterns

NOTE The Payment Pattern Details page displays the specifications associated with the Absolute Payment Pattern Type, which is the default Payment Pattern Type value. Should you decide to change this value for any of the other two alternatives, Relative or Split, the system will refresh the payment specifications corresponding to the new Pattern Type. Although you can change your selection of the Pattern Type at any point in this procedure, sometimes this might cause a loss of data related to any prior selection.

16.2.1 Define Absolute Payment Patterns

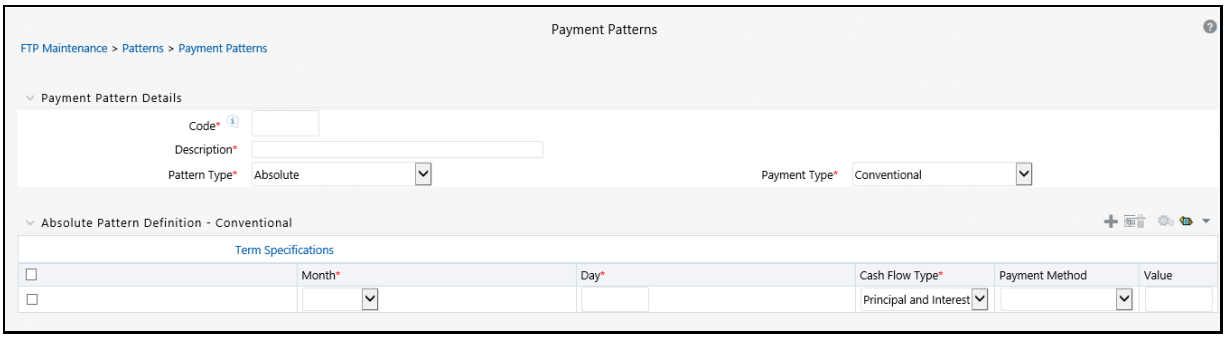
Absolute payment patterns are commonly used for instruments that are on a seasonal schedule, such as agricultural or construction loans that require special payment handling based on months or seasons.

When working with absolute payment patterns, it is sufficient to define payments for one calendar year. Once the term exceeds a year, the payment schedule will loop until the instrument matures.

To define the absolute payment pattern, do the following:

1. Select the Payment Type from the drop-down list: Conventional, Level Principal, or Non-Amortizing. The Payment Type determines the type of information required to successfully define the Payment Phase.

Figure 103: Payment Pattern Type as Absolute Payment Pattern



2. Define the Payment Phases. A Payment Phase is a set of payment characteristics that define the timeline of the instrument's amortization.
3. Define the following parameters:
   - **Month**: This drop-down list allows you to select the month of the payment phase being defined.
   - **Day**: Used to specify the day of the month the payment is due.
4. Select the **Payment Method**. The available Payment Methods depend on the Payment Type. For more information, see: Relation between Payment Method and Payment Types. Payment Methods do not apply to the Non-Amortizing Payment Type.
   - Enter the Value for the Payment Method you selected in the previous step for applicable Payment Types.

If you selected the Interest Only Payment Method in the previous step, the Value field does not apply.

5. Click **Add Another Row** to add additional Payment Phases to the Pattern and click **Delete** corresponding to the rows you want to delete.

> **NOTE** A Payment Pattern must have at least one valid Payment Phase to be successfully defined. The system raises a warning if you try to save a Payment Pattern with an incomplete Payment Phase. You can define up to 365 Payment Phases for each Payment Pattern.

6. Click **Save**.

   The Payment Pattern is saved and the Payment Pattern summary page is displayed.

Important Notes:

When a detailed instrument using an Absolute Payment Pattern is processed for Remaining Term cash flow processing, the Next Payment Date is internally calculated to determine which Payment Phase should be used. The calculated Next Payment Date is only used for this purpose. The Next Payment Date stored on the Instrument record in the Instrument table is always the date used for processing the initial payment.

The following table describes the relationship between Payment Phase properties and Payment Types.

Table 9: Relationship between Payment Phase Properties and Payment Types

	Level Principal	Non-Amortizing	Conventional
Month	Yes	Yes	Yes
Day	Yes	Yes	Yes
Payment Method	Yes		Yes
Value	Yes		Yes

The following table describes the relationship between the Payment Method and Payment Types.

Table 10: Relationship between Payment Methods and Payment Types

Payment Method	Level Principal	Non-Amortizing	Conventional
Percentage of Original Balance	Yes		
Percentage of Current Balance	Yes		
Percentage of Original Payment	Yes		Yes
Percentage of Current Payment	Yes		Yes

Payment Method	Level Principal	Non-Amortizing	Conventional
Absolute Payment	Yes		Yes
Interest Only	Yes		Yes

16.2.2 Define Relative Payment Patterns

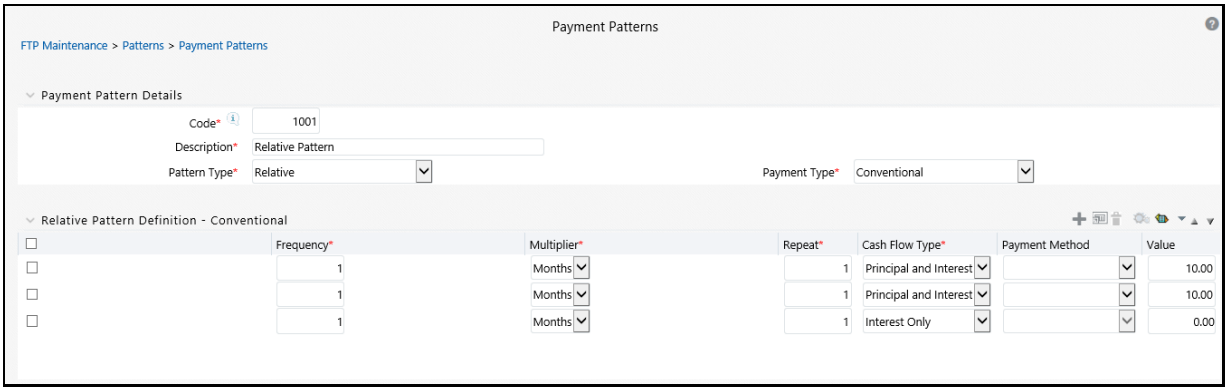
You create Relative Payment patterns for instruments that have irregular scheduled payments.

To define a relative payment pattern, follow these steps:

1. On the Payment Patterns page, select **Relative** as the Pattern Type.
2. Select a relevant **Payment Type** from the following options:
   - Conventional
   - Level Principal
   - Non-Amortizing

   The payment type determines the available characteristics for defining the payment amount.

Figure 104: Payment Pattern Definitions page



3. Define the Payment Phase.

   The payment type determines the type of information required to successfully define the payment phase. For more details, see: Relation between Payment Phase Attributes and Payment Types.
4. Enter the **Frequency** for each payment phase.
5. Select the appropriate **Multiplier** for each payment phase from the following options:
   - Days
   - Months
   - Years
6. Enter the number of times each Payment Phase should be repeated in the **Repeat** column.
7. Select the **Payment Method**.

The available payment methods depend on the payment type. Payment Methods do not apply to the Non-Amortizing Payment Type.

8. Type the **Value** for the Payment Method you selected in the previous step for applicable Payment Types.
9. Click the **Add** icon to add additional Payment Phases to the Pattern and click **Delete** corresponding to the rows you want to delete.

> **TIP** A Payment Pattern must have at least one valid Payment Phase to be successfully defined. The system raises a warning if you try to save a Payment Pattern with an incomplete Payment Phase. You can define up to 365 Payment Phases for each Payment Pattern.

10. Click **Apply**.

    The payment pattern is saved and the Payment Pattern home page is displayed.
11. You can use the **Move Up** and **Move Down** icons to move the Payment Phases up or down. Also, you can click the **Delete** icon to delete a row.

    Any empty rows are ignored and not saved with the payment pattern.

Important Notes:

It is not necessary to set up relative payment patterns for the complete term of an instrument. The payment pattern automatically repeats until the maturity date. Suppose a payment pattern is created to make monthly payments for the first year and quarterly payments for the next three years. If you apply this pattern to an instrument record with an original term of five years, the payment pattern wraps around and the fifth year is scheduled for monthly payments.

An easy way to set up payment patterns for instruments with varying original terms is to use the repeat value of 999 in the last row of the payment pattern. For example, a payment pattern that pays monthly for the first year and quarterly thereafter can be set up with two rows. The first row shows 12 payments in one month. The second row shows 999 payments at three months. When this payment pattern is processed it repeats the three-month payment frequency until the maturity date is reached.

The following table describes the relationship between payment phase attributes and payment types.

Table 11: Relationship between Payment Phases and Payment Types

Payment Phase Attributes	Payment Types: Level Principal	Payment Types: Non-Amortizing	Payment Types: Conventional
Frequency	Yes	Yes	Yes
Multiplier	Yes	Yes	Yes
Repeat	Yes	Yes	Yes
Payment Method	Yes		Yes
Value	Yes		Yes

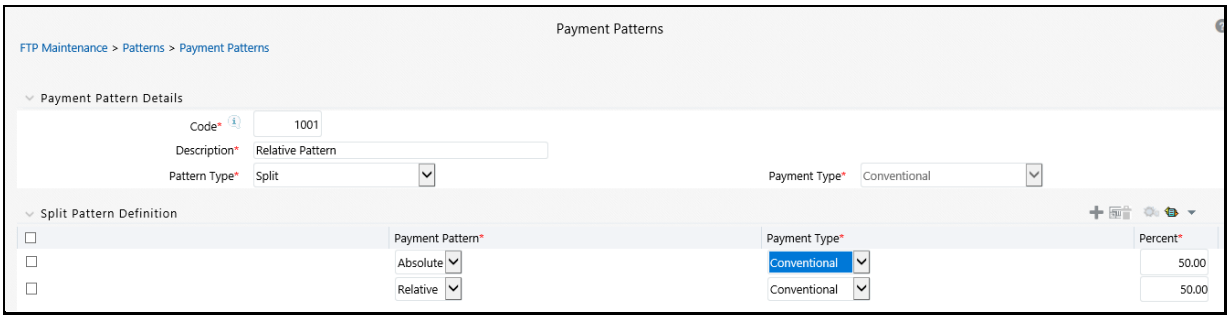
16.3 Defining Split Payment Patterns

You use a Split payment pattern for financial instruments that make principal payments along with two concurrent amortization schedules. Split patterns may be a combination of Absolute and Relative Payment Patterns for example, and contain multiple sets of payment phases under a single amortization code. These patterns could further use a combination of Conventional, Level Principal, and Non-Amortizing Payment Types.

To define a split payment pattern, follow these steps:

1. On the Payment Pattern details page, select **Split** as the Payment Pattern Type. The Create Term Specifications page is displayed.

Figure 105: Payment Patterns Definitions page



2. Select the required Pattern Type for each leg.
   - Absolute
   - Relative
3. Enter the Percent value to indicate the percentage weight of the timeline being defined for the individual payment phases (each row). The sum of the percentage weights must total 100%.
4. Select the Payment Type for each Payment Phase or Split.

> **TIP** The payment pattern term specifications for different payment phases or splits vary depending on whether you select the Absolute or Relative Pattern Type. You can define the term specifications for the splits following the steps described previously for defining payment phases for these patterns. See:
>
> - Define Absolute Payment Patterns
> - Define Relative Payment Patterns

5. Select one of the legs and then select **Apply** to define pattern details for the leg.
6. Click **Save**.

   The Split payment pattern is saved and the Payment Pattern summary page is displayed.

17 User-Defined Repricing Patterns

User-defined repricing patterns provide a mechanism to capture instrument repricing patterns that are too complex to be accommodated through the use of the standard account table fields.

The procedure for working with and managing repricing patterns is, similar to that of other Oracle Funds Transfer Pricing business rules. It includes the following steps:

- Searching for Repricing Patterns
- Creating a Repricing Pattern
- Viewing and Editing Repricing Patterns
- Copying Repricing Patterns
- Deleting Repricing Patterns

17.1 Searching for Repricing Patterns

Search for a repricing pattern to perform any of the following tasks:

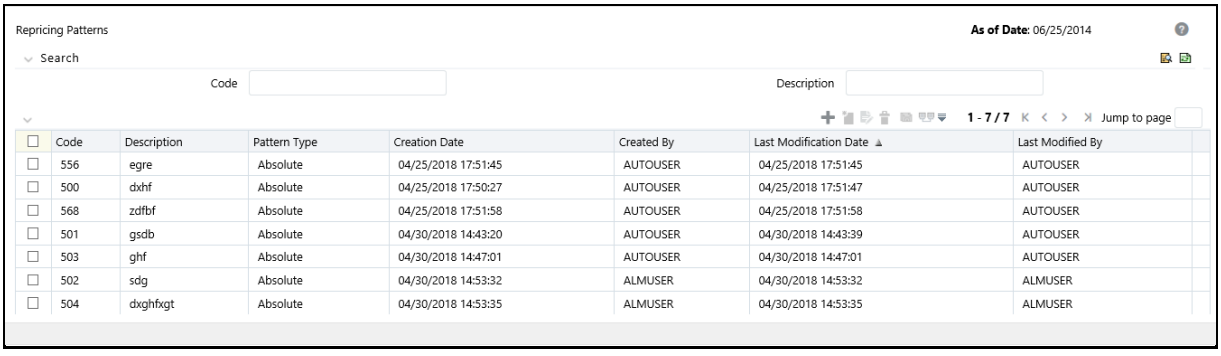
- View
- Edit
- Copy
- Delete
- Check Dependencies

You must have defined the repricing patterns to search for the repricing patterns.

To search the repricing patterns, do the following:

1. Navigate to the Repricing Pattern summary page. This page is the gateway to all repricing patterns and related functionality. You can navigate to other pages relating to repricing patterns from this point.

Figure 106: Repricing Patters Summary page



Code	Description	Pattern Type	Creation Date	Created By	Last Modification Date	Last Modified By
556	egre	Absolute	04/25/2018 17:51:45	AUTOUSER	04/25/2018 17:51:45	AUTOUSER
500	dxhf	Absolute	04/25/2018 17:50:27	AUTOUSER	04/25/2018 17:51:47	AUTOUSER
568	zdfbf	Absolute	04/25/2018 17:51:58	AUTOUSER	04/25/2018 17:51:58	AUTOUSER
501	gsdb	Absolute	04/30/2018 14:43:20	AUTOUSER	04/30/2018 14:43:39	AUTOUSER
503	ghf	Absolute	04/30/2018 14:47:01	AUTOUSER	04/30/2018 14:47:01	AUTOUSER
502	sdg	Absolute	04/30/2018 14:53:32	ALMUSER	04/30/2018 14:53:32	ALMUSER
504	dxghfxgt	Absolute	04/30/2018 14:53:35	ALMUSER	04/30/2018 14:53:35	ALMUSER

2. Enter the Search criteria.
3. Enter the code or description of the pattern.
4. Select the Search icon.

Only patterns that match the search criteria are displayed.

17.2 Creating Repricing Patterns

You create Repricing patterns to capture the repricing behavior of instruments whose rates change according to complex schedules.

To create the repricing patterns, do the following:

1. Navigate to the Repricing Pattern summary page.
2. Click Add Repricing Pattern.

   The Add Repricing Pattern page is displayed.
3. Type a code value for the new Repricing Pattern.

   The code is a numeric internal identifier for the repricing pattern. The code value must be a number between 500 and 4999 and the code value you assign to the new pattern must be unique. Also, the code must be mapped to the appropriate instrument records (ADJUSTABLE_TYPE_CD field) to connect the instrument to the appropriate pattern.
4. Type a brief description of the pattern.
5. Select the Repricing Pattern Type: Absolute or Relative.

   The selection of the repricing pattern type determines the fields that are displayed in the Repricing Events table and the information you must provide to successfully define that pattern type. See:

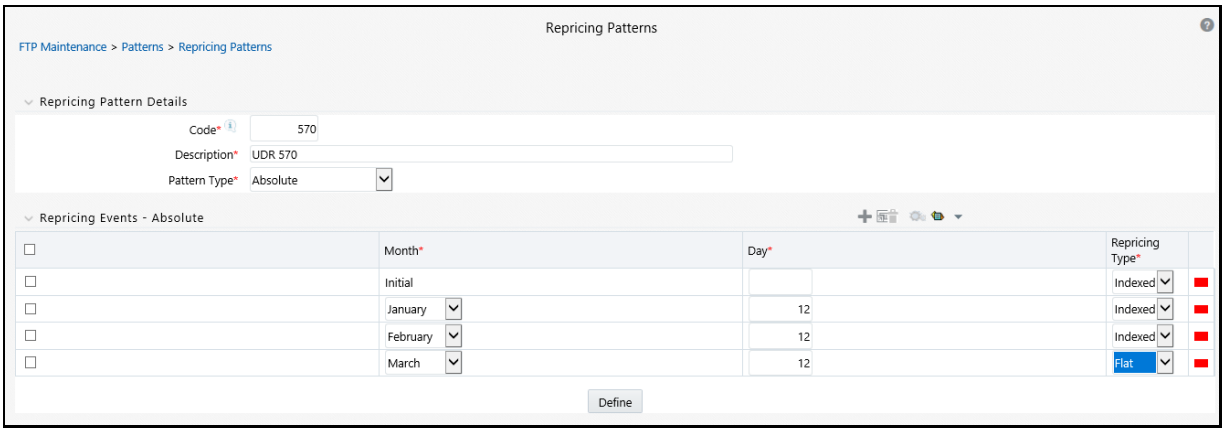
   - Defining Absolute Repricing Patterns
   - Defining Relative Repricing Patterns

The Add Repricing Pattern page displays the parameters associated with the Absolute repricing pattern type, which is the default repricing pattern type value. If you change this value to Relative, the system refreshes the repricing specifications corresponding to the new pattern type, and any data entered previously is lost. However, a warning message is displayed when you change the pattern type. The data is discarded only after your confirmation.

17.2.1 Defining Absolute Repricing Patterns

The Absolute repricing pattern is used for instruments that are date-dependent. Each specific date is a separate event. You need to enter the month and day for each event, except for the initial event.

Figure 107: Repricing Pattern Details with Pattern Type Absolute



To define an absolute repricing pattern, do the following:

1. Select Pattern Type as **Absolute**. This screen allows you to do the following:
   - **Add Row**: This allows you to add one or more repricing events.
   - **Delete**: This allows you to delete specific rows in the Repricing Events table.
2. Click **Add Event**.
3. Enter the following details:
   - **Month**: In conjunction with the Day field, this drop-down menu, allows you to specify a unique month-day combination for a repricing event.
   - **Day**: In conjunction with the Month drop-down menu, this field allows you to specify a unique month-day combination for a repricing event.
4. Select the Repricing Type: **Flat** or **Indexed**.

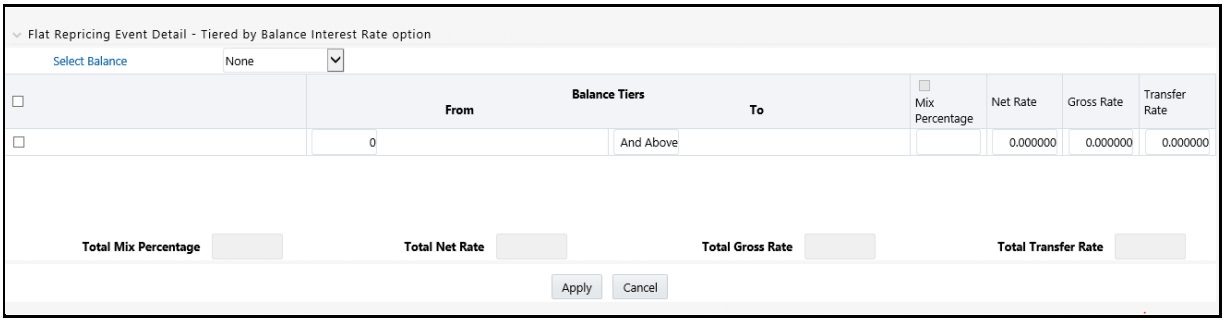
   The default is Flat. If you select Indexed, the system automatically changes the fields available for entry. See Indexed Repricing.

   You can change your selection of the repricing type at any point in this process. Sometimes it may cause a loss of data.

   - **Flat Rate**: A Flat rate is a specific rate—it is directly input. For more information, see User-Defined Repricing Event.

   To define a Flat Rate Event, select the check box for the event you are going to define and select the **Define** button. Notice the bottom half of the screen refreshes, displaying the required inputs. Complete the following steps on the Add Repricing Events page:

Figure 108: Flat Repricing Pattern Detail Pane



5. Select Balance Tier option:
   - **None**: If selected, the Balance Tiered pricing is not applied.
   - **Current Balance**: Users can define balance tiers and associate different rates with the corresponding balance tier level.
     - Specify the required month-day combination for the event. You cannot specify a month-day combination for the first event as this row is reserved for the initial period.
     - Enter the Net Rate.
     - Enter the Gross Rate.
     - Enter the Transfer Rate.

> **NOTE** You must enter a valid value for at least one of these rate fields.

6. Click **Apply**.

   The Event summary Page is displayed. Note that the status indicator has changed from Red to Green indicating that details for the event are defined. At this point, you have the option of defining additional events or saving. To add another event, repeat Step 2. If you want to save the repricing pattern and events, advance to the next step.

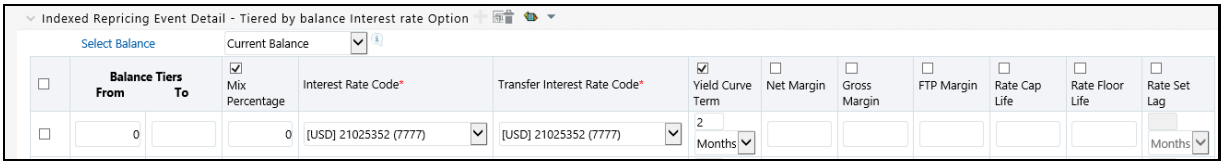
Repricing Event is Indexed Repricing:

An Indexed rate is a set of parameters used to calculate a rate. For more information, see User-Defined Repricing Event.

If you select **Repricing Event** as **Indexed Repricing**, to define the absolute repricing pattern, do the following:

7. Select the check box for the event you are going to define and select the **Define** button. Notice the bottom half of the screen refreshes, displaying the required inputs. Complete the following steps on the Add Repricing Events page:

Figure 109: Indexed Repricing Event Detail



8. Select the check box above each column that you want to include in the repricing event
9. Select a Balance Tier option:
   - **None**: The Balance Tiered pricing is not applied.
   - **Current Balance**: The users can define balance tiers and associate different rates with the corresponding balance tier level.
     - Select the **Interest Rate Code**.
     - Select the **Transfer Interest Rate Code**.

- Enter the **Net Margin**.
- Enter the **Yield Curve Term** and select the appropriate **Multiplier**.
- Enter the **Gross Margin**.
- Enter the **FTP Margin**.
- Enter the **Rate Cap Life**.
- Enter the **Rate Floor Life**.
- Enter the **Rate Set Lag** and select the appropriate **Multiplier**.

10. Click **Apply**. The Event Summary page is displayed.

    At this point, you have the option of defining additional events or saving. To add another event, repeat the **Click Add Event**. If you want to save the repricing pattern and events, advance to the next step.

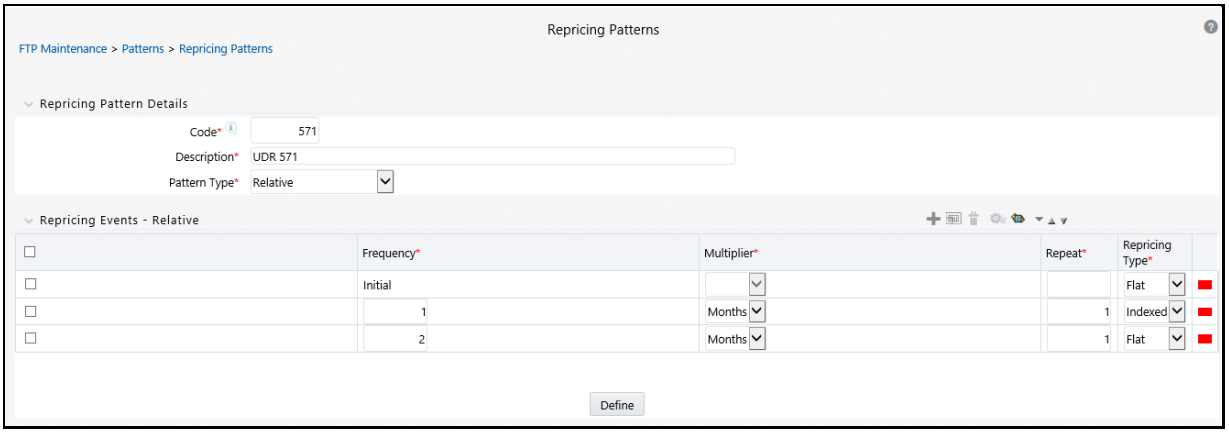
11. Click **Save** at the bottom of the page.

    The repricing pattern is saved and the Repricing Pattern summary page is displayed.

17.2.2 Defining Relative Repricing Patterns

The Relative repricing pattern is used for instruments where the repricing is determined by the elapsed time since origination. Defining a Relative repricing pattern involves the definition of a series of repricing events applicable to a specific repricing pattern code. You need to specify the length of each repricing period and the number of times that event should occur before calculating the next event in the pattern.

Figure 110: Repricing Pattern with Patter Type Relative



The steps to create relative repricing patterns are similar to creating absolute repricing patterns.

The only difference is that the fields in the Repricing Events table are different.

Select Pattern Type as **Relative**. This page allows you to do the following:

- **Add**: This allows you to add one or more repricing events.
- **Move Up**: This allows you to move a particular row up by one position. This action for the first and second rows is not active.

- **Move Down**: This allows you to move a particular row down by one position. This action for the first and last rows is not active.
- **Delete**: This allows you to delete specific rows in the Repricing Events table.

You need to specify the following parameters in the Repricing Events table for a Relative repricing pattern:

- **Frequency**: In conjunction with the Multiplier drop-down menu, this field allows you to specify how often repricing occurs.
- **Multiplier**: The unit of time applied to the frequency. The choices are:
  - Days
  - Months
  - Years
- **Repeat**: This allows you to specify the number of times a repricing event should be repeated.
- **Repricing Type**: A drop-down list, displays the repricing type, Flat rate, or Indexed rate, associated with a particular event.

After defining the above details, click **Define**. The Event summary Page is displayed. Note that the status indicator turns from Red to Green indicating that details for the event are defined.

18 Behavior Pattern Rule

This module describes the procedure for working with and managing Behavior Pattern rules.

This chapter covers the following topics:

18.1 Creating Behavior Pattern Rules

You create a behavior pattern rule to capture the principal run-off behavior of product types that do not have contractual maturities.

18.2 Procedure

1. Navigate to the BSP Assumption Specification-> Behavior Pattern Rule page.
2. The Behavior Pattern Rule summary page is displayed. Click Add Behavior Pattern Rule.
3. Complete standard steps for this procedure.

   Important: In addition to the standard steps for creating rules, the Procedure for creating a Behavior Pattern rule involves one extra step. After Standard Step 6, you need to select a product hierarchy.

   You can define methodologies at any level of the hierarchical product dimension. The hierarchical relationship between the nodes allows the inheritance of methodologies from parent nodes to child nodes.

18.3 Defining Behavior Pattern Rule

The definition of a Behavior Pattern rule is part of the Create or Edit Behavior Pattern rule process. When you click Save in the Create Behavior Pattern rule process, the rule is saved and the Behavior Pattern rule summary page is displayed.

However, Behavior Pattern assumptions have not yet been defined for any of your products at this point. Typically, you would start defining your Behavior Pattern assumptions for product-currency combinations before clicking **Save**.

Defining Behavior Pattern Rule Using Node Level Assumptions

Node Level Assumptions allow you to define assumptions at any level of the Product dimension Hierarchy. The Product dimension supports a hierarchical representation of your chart of accounts, so you can take advantage of the parent-child relationships defined for the various nodes of your product hierarchies while defining rules. Children of parent nodes on a hierarchy automatically inherit the assumptions defined for the parent nodes. However, assumptions directly defined for a child take precedence over those at the parent level.

18.3.1 Prerequisites

Performing basic steps for creating or editing a Behavior Pattern rule

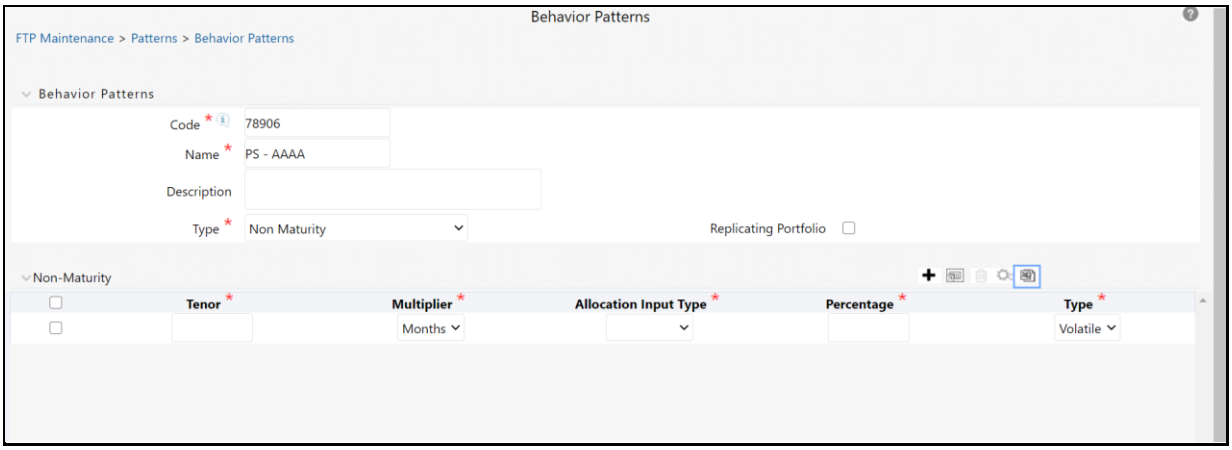
18.3.2 Procedure

From the Assumption Browser screen, select the product(s) and the currency for which you want to define a Behavior Pattern(s) and select the “Add New” button to launch the Behavior Pattern Details screen.

> **NOTE** Using the default currency to set up assumptions can save data input time. At run time, the calculation engine uses assumptions explicitly defined for a product currency combination. If assumptions are not defined for a currency, the engine uses the assumptions defined for the product and the default currency. If the assumptions are the same across some or all currencies for a specific product, you can input assumptions for the default currency. Be careful using this option on screens where an Interest Rate.

18.3.2.1 The Behavior Pattern Details screen

Figure 111: Behavior Patterns Details Page

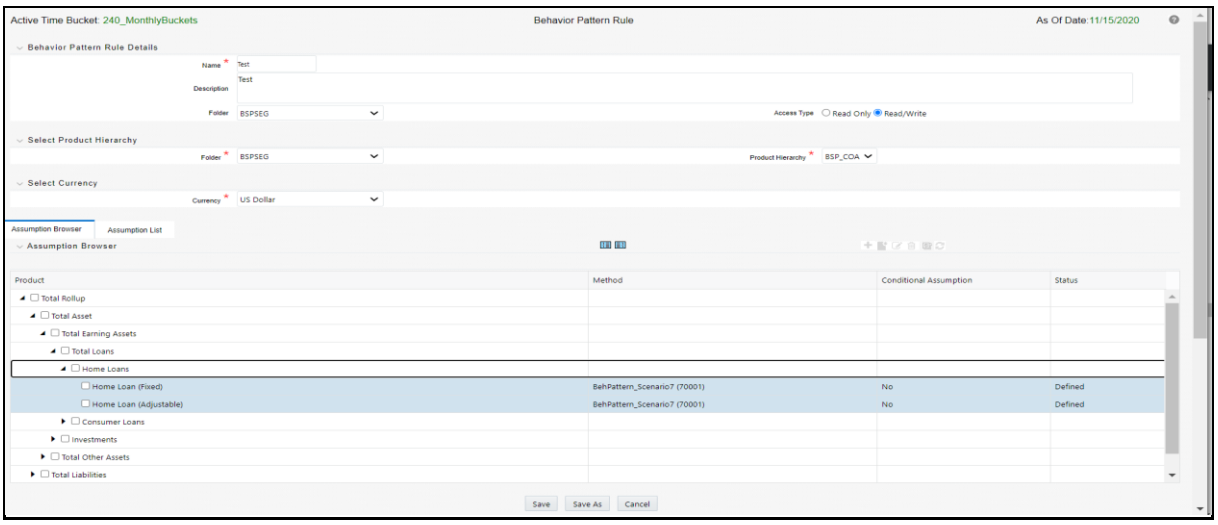


18.3.3 Defining a Behavior Pattern Rule: An Example

To create a Behavior Pattern rule, enter the following details on Behavior Pattern Rule UI:

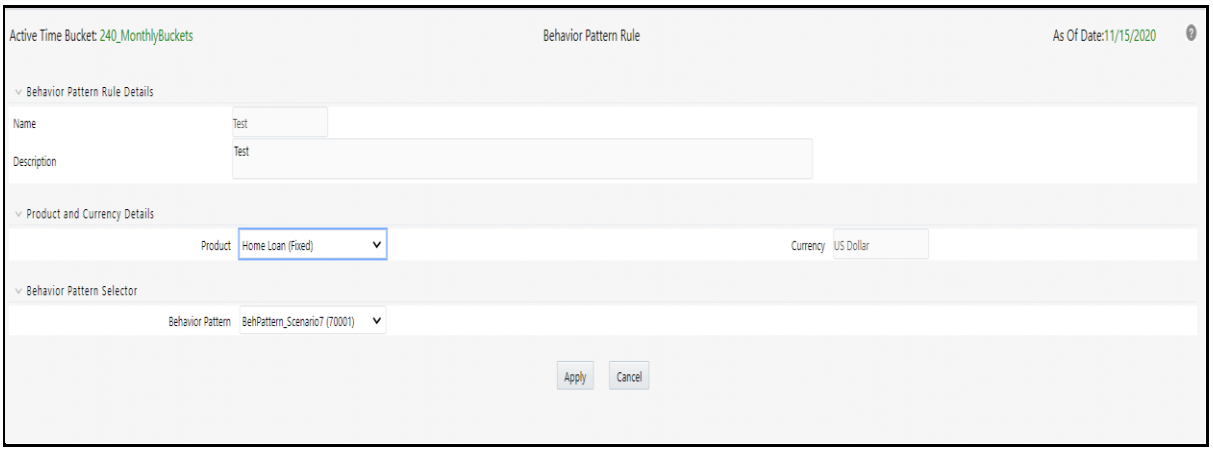
1. From the Assumption Browser, select Currency (US Dollar) and Total Loans.
   - Name
   - Description
   - Folder
   - Access Type

Figure 112: Access Type



2. From the Assumption Browser, select Currency (US Dollar) and a product from the hierarchy browser. Select the Add New icon to enter the Assumption Details page.
3. Select a pattern from the Behavior Pattern selector. Here, the Behavior Pattern drop down shows the list of existing Behavior patterns. For more information, see the User-defined Behavior Pattern chapter. You can select only one Behavior Pattern at a time.

Figure 113: Behavior Pattern Selector



4. Click Apply.

19 Time Buckets

This module describes the procedure for working with and managing Time Bucket rules.

This chapter covers the following topics:

19.1 Overview of Time Bucket Rules

Time Bucket rules allow users to create the various time bucket definitions used for computing and outputting aggregated cash flows. Time Bucket rules determine the granularity of cash flow output and can be set at any frequency through a combination of daily, monthly, and yearly buckets.

BSP shares the same user interface as ALM, but is limited to monthly time buckets set up using the Income Simulation tab. BSP does not utilize Interest Rate GAP or Liquidity GAP Time Bucket definitions.

Only BSP System Administrators actively use Time Bucket rules. In BSP, all other users (Planning Administrators and Planning Users) do not actively set up any time buckets. Instead, BSP builds its own synthetic time bucketing rules whenever you define a new Forecast Set.

For example, if you define a new Forecast Set that has a duration of 18 months, any planning user who executes cash flows against that Forecast Set will be using an 18-month, monthly time bucket rule.

For BSP, it is recommended that the System Administrator uses a single Time Bucket rule whose duration will be longer than the duration of any Forecast Set you may plan to use.

In general, Time Buckets can be defined for the following type of output:

- Income Simulation
- Interest Rate GAP
- Liquidity GAP

Income Simulation Buckets allow you to specify the periods used for storing and reporting results. These bucket definitions set the modeling horizon for date-related business rule assumptions. When you change the number or frequency of the modeling buckets, existing business rules are affected.

NOTE

Be cautious when changing Time Bucket definitions when known dependencies exist.

You can specify any combination of days, months, and years when setting up the buckets. Although all cash flows are generated daily, they are aggregated into defined income simulation buckets when results are stored. Reports access information from the income simulation buckets and let you aggregate buckets. For example, you can define monthly income simulation buckets but generate a quarterly income statement. On the other hand, you cannot generate a weekly balance sheet if all income simulation buckets are monthly.

If you want to use different configurations of income simulation buckets, such as all monthly or all quarterly, you should create a separate Time Bucket rule for each and use an appropriate naming convention to identify these characteristics. All date-related assumption rules should be defined and used in the context of a single set of Income Simulation buckets or a single Time Bucket rule.

Income Simulation Bucket definitions are referenced by all bucket-based forecast business rules, including Forecast Rates, Forecast Balances, Pricing Margins, and Maturity Mix rules and also by BSP Deterministic Processes during BSP engine processing.

Interest Rate GAP Buckets allow you to define Interest Rate (repricing) GAP buckets including a catch-all bucket to move reprice gap output for Non-Interest Rate Sensitive products. Interest Rate GAP Buckets are not utilized by BSP. For information on how Interest Rate GAP Buckets are used by OFSAA Cash Flow Engine, see the OFSAA ALM User Guide and the *OFSAA Cash Flow Engine Reference Guide*.

With this Dynamic Start Date capability, users can also define forward start dates for computing dynamic market valuations. The Dynamic Start Date capability allows you to consider amortization of existing business and any new business assumptions that are applicable between the current as of the date and the future dated – Dynamic Start Date. You must set up Income Simulation Buckets before defining Interest Rate GAP Buckets. Note that Dynamic Start dates are not supported in BSP.

NOTE

Only Interest Rate GAP financial elements are impacted by the Interest Rate GAP bucket definitions. The Interest Rate GAP financial elements range from FE660 to FE700.

Liquidity GAP Buckets are similar to Interest Rate GAP buckets. The only difference is that Liquidity Bucket definitions impact only the Liquidity Runoff financial elements, which range from FE 1660 to 1717.

The procedure for working with and managing Time Bucket rules is similar to that of other Balance Sheet Planning business rules. It includes the following steps:

- Searching for Time Bucket rules. For more information, see the Searching for Rules section.
- Creating Time Bucket Rules, For more information, see the Creating Rules section.
- Viewing and Editing Time Bucket rules. For more information, see the Viewing and Editing Rules section.

- Copying Time Bucket rules. For more information, see the Copying Rules section.
- Deleting Time Bucket rules. For more information, see the Deleting Rules section.

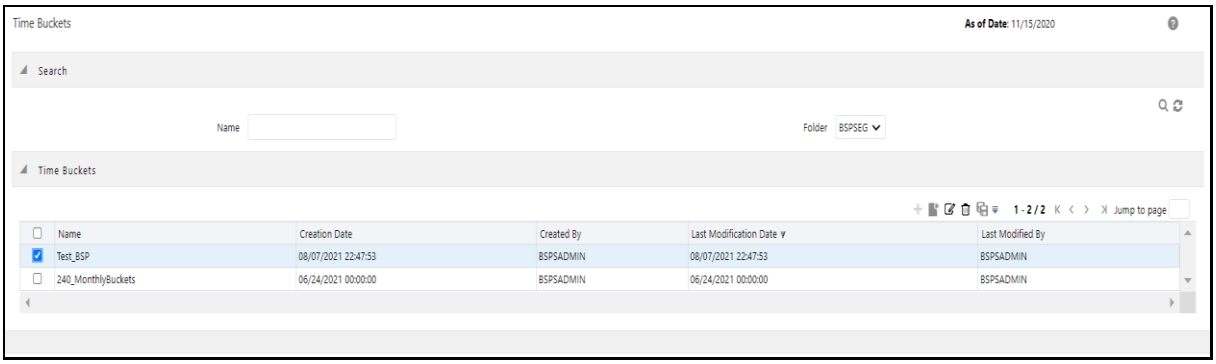
19.2 Creating Time Bucket Rules

You create Time Bucket rules to specify the periods used for storing and reporting BSP results.

Procedure

1. Navigate to the Time Buckets summary page.

Figure 114: Time Buckets Summary Page



2. Complete standard steps for this procedure. For more information, see Creating Rules section.

19.3 Defining Time Bucket Rules

The definition of a Time Bucket rule is part of the Create or Edit Time Buckets rule process. When you click Save in the Create Time Buckets rule process, the rule is saved and the Time Buckets rule summary page is displayed. However, Time Bucket assumptions may not have been defined at this point. Typically, you would start defining your Time Bucket assumptions before clicking Save.

19.3.1 Prerequisites

Performing basic steps for creating or editing a Time Bucket rule.

19.3.2 Procedure

From the Time Bucket details screen, you have one tab available for creating Time Bucket definitions.

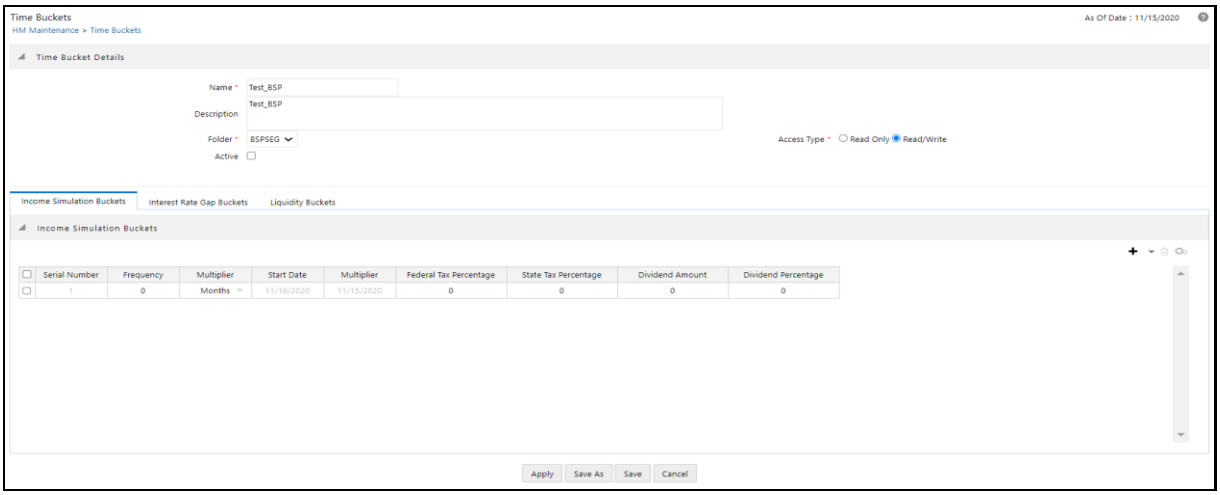
- Income Simulation Buckets (required)
- Interest Rate GAP Buckets, including Non-Interest Rate Sensitive Bucket (required only if Repricing Gap is selected during processing). For Non-Interest Rate Sensitive Bucket, both Repricing Gap and Include Non-Rate Sensitive Bucket are required selections.)
- Liquidity GAP Buckets (required only if Liquidity Gap is selected during processing)

The first step is to define your Income Simulation buckets.

From the Income Simulation tab, do the following:

1. Click the Add Rows button and input the desired number of rows corresponding to the number of Income Simulation Buckets you would like to create.

Figure 115: Income Simulation tab



> **NOTE** You can select a pre-defined number of rows from the list, For example, 3, 5, or 10, or you can input the exact number of rows you would like to add. The maximum number of buckets you have under any tab is 240.

2. Under Frequency, input a numeric value, For example, 1. The Frequency column displays the duration of the multiplier. The frequency in conjunction with the multiplier displays the duration of the buckets. The frequency can be any number from 1 to 999. Under Multiplier, select an appropriate value from the list. The Multiplier column includes Daily, Monthly, or Yearly choices.

> **NOTE** Limit the definition of Income Simulation buckets to the date range that is relevant to your reporting requirement. It is not necessary to create "catch-all" buckets at the end of the series. When large buckets are created, for instance, 99 Years, this can result in the following error:
>
> INSERT Oracle Error: ORA- 01426: numeric overflow Driver
>
> Function: drv_oci::Execute()

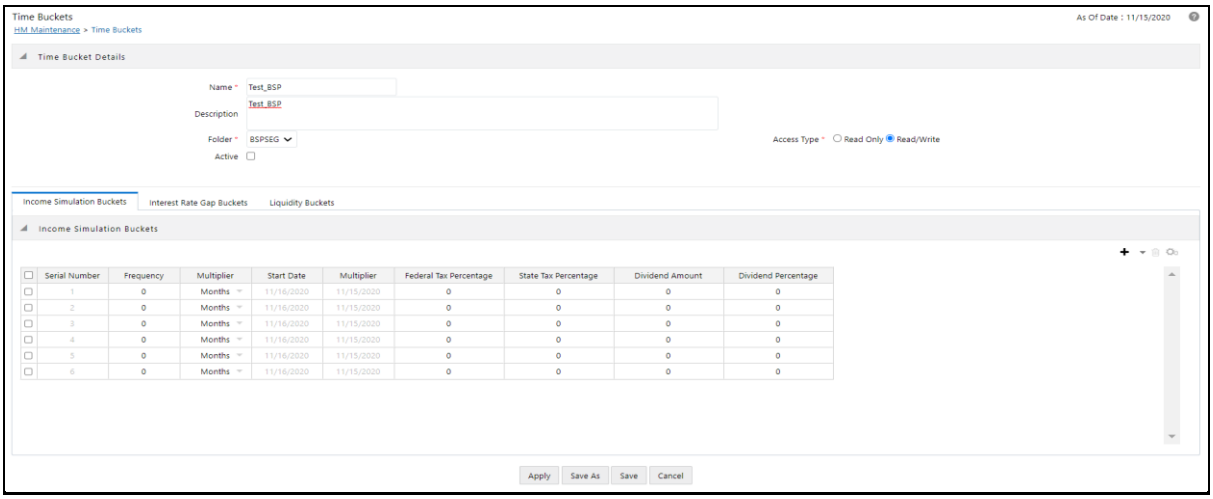
3. Continue adding frequencies and multipliers as needed.

Table 12: Frequencies and Multipliers

Frequency	Multiplier
1	Month
1	Month
1	Month
1	Month
1	Month.....

4. After you fill in the frequencies and multipliers, the start and end dates are calculated automatically based on the As of Date, defined in your Application Preference settings.

Figure 116: Income Simulation Tab



NOTE You may want to utilize the Data Input Helper to copy from a row where you have already defined the time bucket definition or apply a fixed value down the page. The following optional steps describe how to use this feature.

a. Select the check box next to the rows that you want to work with or use the " Select ALL" option by selecting the check box on the header row

b. Select the Data Input Helper icon.

c. From the Data Input Helper – popup screen, select Method – "Keep Current Values" or some other appropriate method.

d. Select the Frequency and/or Multiplier from the left side of the shuttle box.

e. Select APPLY to copy assumptions to the selected rows.

> **NOTE** Steps 5, 6, and 7 are utilized in ALM's auto-balancing function but are not used in BSP.

5. After defining time bucket frequencies, move across each row to input the appropriate Federal Tax Percentages and State Tax Percentages.

   Tax percentages are used in BSP when processing with the auto-balancing option selected. Type 35.00 for 35%. The tax rate entered is interpreted as the tax rate for that bucket regardless of the frequency of the bucket. That is, 35% entered for a monthly bucket is applied as a 35% monthly rate to the taxable income forecast for that month.

6. Under Dividend Amount, type a value. Dividend amounts are used in HM when processing with the auto-balancing option selected. The values you enter here will be paid out as dividends for all rate scenarios.

7. Under Dividend Percentage, type a value. Dividend percentages are used during auto-balancing calculations. The dividend percentage is defined as a percent of the net income after tax that will be paid out as dividends for the period.

   Total Dividends = Dividends Amount + (Dividends Percent x Net Income after Tax)

8. Select SAVE if you are finished.

> **NOTE** For BSP, no other steps are required. BSP does not support Interest Rate GAP Time Buckets and BSP does not support Liquidity GAP Time Buckets.

Otherwise, navigate to the Interest Rate GAP Buckets tab.

After defining Income Simulation buckets, navigate to the Interest Rate GAP Buckets tab. The Interest Rate GAP bucket detail page provides two important inputs. The first is the ability to define Interest Rate GAP buckets and optionally add a Non-Interest Rate Sensitive bucket for Non-Rate Sensitive products. The second capability allows you to define one or more Dynamic Start Dates. The following steps explain how to complete each of these setup tasks.

> **NOTE** The Interest Rate GAP bucket can be defined from Bucket count 1 till Bucket count 239 in all dynamic start dates. The last time series time bucket in all dynamic start dates will default to 99 years as a “catch-all” bucket. This is used to verify the total runoff for reporting requirements.

From the Interest Rate GAP Buckets tab, do the following:

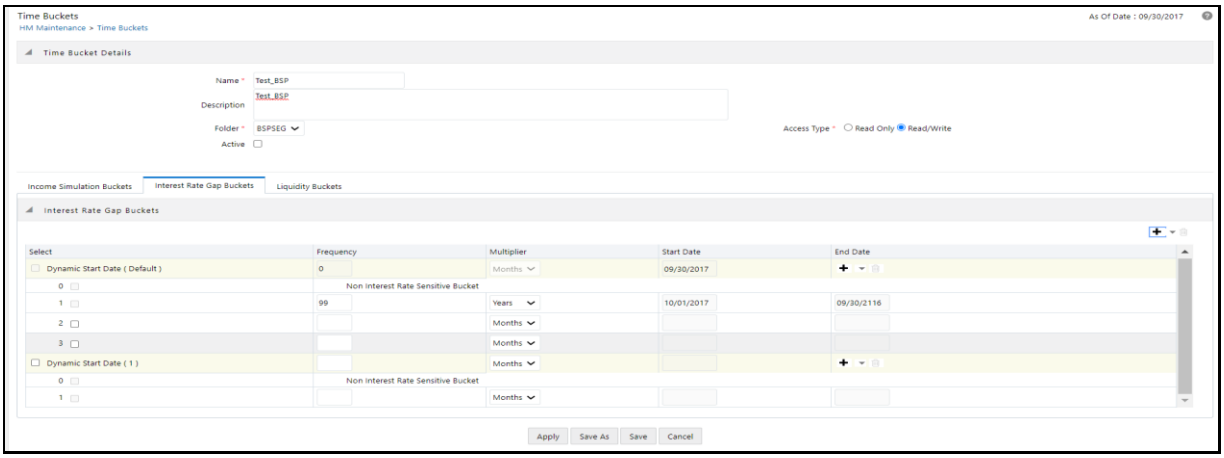
9. Click the Add Rows button corresponding to the Default Dynamic Start Date and input the desired number of rows for your Interest Rate GAP Buckets.

NOTE

By default, the first-time bucket in Interest Rate Gap Buckets (bucket count 0) is defined as Non-Interest Rate Sensitive Bucket.

A new Attribute of the product dimension 'Interest Rate Sensitivity Category' is introduced to identify products as Interest Rate sensitive or Non-Interest Rate sensitive. Once a product is mapped as Non-Interest Rate sensitive, the user also needs to enable 'Include Non-Interest Rate Sensitive Bucket' in Process Rules (see BSP Processing). This would move to reprice gap output from Non-Interest Rate Sensitive products into Non-Interest Rate Sensitive Bucket.

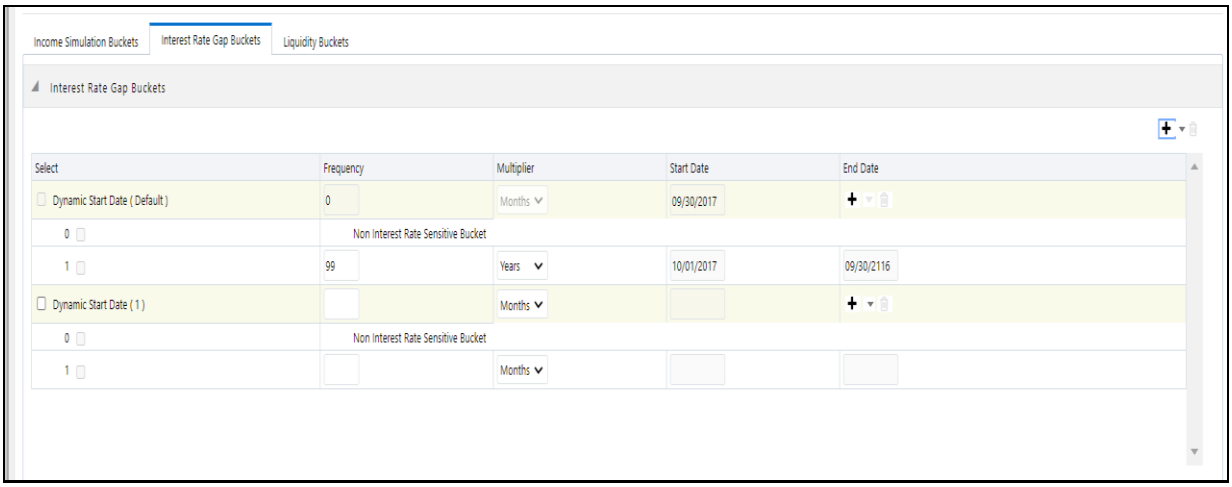
Figure 117: Interest Rate Gap Buckets Tab



10. Follow steps 2 — 4 described above under Income Simulation buckets, to complete the setup of your Interest Rate GAP buckets and Non-Interest Rate Sensitive Bucket for the default Dynamic Start Date.

11. If you would like to define additional – forward dated, Dynamic Start Dates, Click the "Add Dynamic Start Date" button to add one or more parent nodes to the bucket hierarchy.

Figure 118: Interest Rate Gap Buckets Tab



12. For each additional Dynamic Start Date row, input a Frequency and Multiplier to determine future start date(s).
13. Click the Add Rows button corresponding to each new Dynamic Start Date and repeat the Interest Rate GAP Bucket definition steps described above to complete the setup.
14. For a more detailed example on creating additional Dynamic Start Dates.

After defining Interest Rate GAP buckets, navigate to the Liquidity Buckets tab. The Liquidity Buckets detail page has the same structure as the Interest Rate GAP details page. It allows you to define the Liquidity GAP Buckets for the default Dynamic Start Date and also allows you to add one or more additional Dynamic Start Dates. The use of Dynamic Start Dates will allow you to forecast your liquidity position as of some future point in time, considering all relevant assumptions, including amortization, prepayments, early withdrawals, and rollovers.

> **NOTE** By default, the last time series time bucket in all dynamic start dates will default to 99 years as a "catch-all" bucket. This is used to verify the total runoff for reporting requirements.

From the Liquidity Buckets tab, do the following:

15. Click the Add Rows button corresponding to the Default Dynamic Start Date and input the desired number of rows for your Liquidity Buckets.
16. Follow steps 2 – 4 described above under Income Simulation buckets, to complete the setup of your Liquidity Buckets for the default Dynamic Start Date.
17. If you would like to define additional – forward dated, Dynamic Start Dates, Click the "Add Dynamic Start Date" button to add one or more parent nodes to the bucket hierarchy.
18. If needed, input a Frequency and Multiplier for the new Dynamic Start Date to determine the future start date.
19. Click the Add Rows button corresponding to the new Dynamic Start Date and repeat the Liquidity GAP Bucket definition steps described above.
20. For a more detailed example on creating additional Dynamic Start Dates, see Example
21. Once you have completed the setup for all bucket types, click the SAVE button.

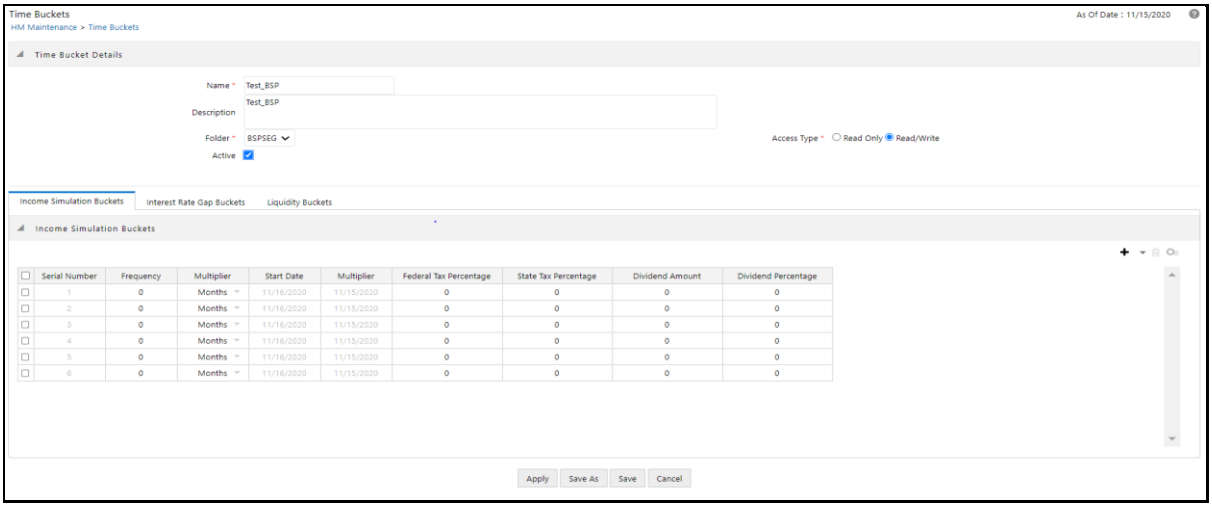
19.3.2.1 Excel Import/Export

Excel import/export functionality is used for adding/editing time bucket information. For more details, see Excel Import/Export

19.3.2.2 Additional Required Steps

All users must have an “Active” Time Bucket Rule at all times. There is a check box at the top of the page, above the Bucket tabs. If you wish to “Activate” a particular Time Bucket Rule, simply check this box and Save the Rule. You will note the Active Time Bucket rule for your user appears on the Title bar in green text.

Figure 119: Time Bucket Details



NOTE Each time you change the As of Date in your Application Preferences screen, all Time Bucket Rule Bucket Start Date and Bucket End Date are updated automatically.

20 Default Product Profiles

Product Characteristic setup can be a time-consuming process as there are more than 40 attributes that can be required when defining characteristics for dimension members in the product COA hierarchy. Product Profiles allow you to pre-define and save common product definitions and reference these definitions while defining your Product Characteristic assumptions. Setup time is reduced because product profiles provide common default values for the majority of required fields. The following Product Profiles are seeded during installation:

- Bond – Adjustable Rate
- Bond – Fixed Rate
- Credit Card
- Discount Instrument
- Lease
- Loan – Adjustable Rate
- Loan – Fixed Rate
- Loan – Floating Rate
- Loan – Neg Am
- Savings
- Term Deposit

In addition to the seeded profiles, you can add custom product profiles to your setup by creating completely new profiles or by using the Save As option with one of the existing profiles.

> **NOTE** The seeded Product Profiles are not editable and cannot be deleted.

The procedure for working with and managing Product Profiles is similar to that of other Asset | Liability Management business rules. It includes the following steps:

- Viewing a seeded Product Profile
- Creating Product Profiles
- Summary of Seeded Product Profiles

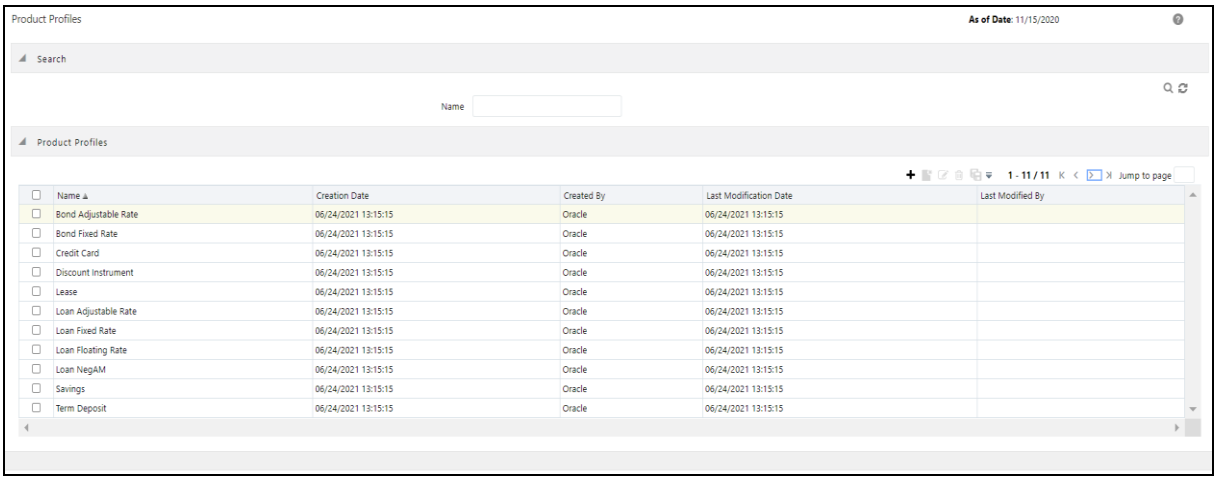
20.1 Viewing a seeded Product Profile

You can review any of the twelve seeded Product Profile definitions.

Procedure

1. Navigate to the Product Profile summary page.

Figure 120: Product Profile Summary



2. Select the check box next to the Product Profile you want to View and select the View Icon.
3. Navigate through the All Business and New Business tabs to review the seeded values.

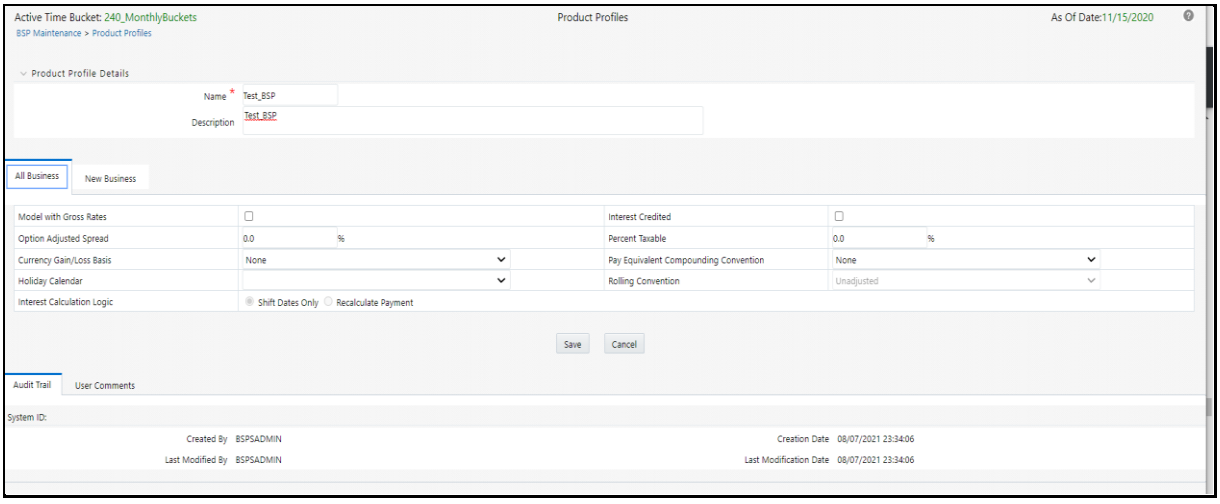
20.2 Creating Product Profiles

You create Product Profiles to assign default attributes for common products and then reference these product profiles within your Product Characteristic assumption rules to reduce setup time. In addition to the seeded Product Profile templates, you can also create new Profiles.

Procedure

1. Navigate to the Product Profile summary page.
2. Complete standard steps for this procedure.

Figure 121: Product Profiles – All Products



3. Enter a Name and Description for the new Profile.
4. Define product attributes for the profile you are creating. For more information on individual attributes, see (Mandatory) Defining Product Characteristics
5. Click Save to complete the new profile definition.

20.3 Summary of Seeded Product Profiles

The following tables summarize the attributes defined for each product profile:

Table 13: Bond Adjustment Rate

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Non-Amortizing	Amortization Type
New Business > Define Core Product Attributes >	Other Adjustable	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	6 Months	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >	6 Months	Repricing Frequency
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score

Location	Default Value	Attribute
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Negative Amortization Attributes >		<Not Applicable>
New Business>Define Inflation Adjustment Attributes >	0	Index Name
New Business>Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business>Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 14: Bond Fixed Rate

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Non-Amortizing	Amortization Type

Location	Default Value	Attribute
New Business > Define Core Product Attributes >	Fixed Rate	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	6 Months	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		<Not Applicable>
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 15: Credit Cards

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Behavior Pattern	Amortization Type
New Business > Define Core Product Attributes >	Floating Rate	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		<Not Applicable>
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>

Location	Default Value	Attribute
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 16: Discount Instruments

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Non-Amortizing	Amortization Type
New Business > Define Core Product Attributes >	Fixed Rate	Adjustable Type
New Business > Define Core Product Attributes >	3.0%	Original Deferred Amortization %
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument

Location	Default Value	Attribute
New Business > Define Payment Attributes >	90 Days	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / 360	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		<Not Applicable>
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 17: Lease

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar

Location	Default Value	Attribute
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Lease	Amortization Type
New Business > Define Core Product Attributes >	Fixed Rate	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / 360	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		<Not Applicable>
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type

Location	Default Value	Attribute
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 18: Loan Adjustment Rate

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Conventional Adjustable	Amortization Type
New Business > Define Core Product Attributes >	Other Adjustable	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag

Location	Default Value	Attribute
New Business > Define Adjustable Rate Attributes >	1 Year	Repricing Frequency
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 19: Loan Fixed Rate

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Conventional Fixed	Amortization Type

Location	Default Value	Attribute
New Business > Define Core Product Attributes >	Fixed	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		< Not Applicable >
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 20: Loan Floating Rate

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention

Location	Default Value	Attribute
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Conventional Adjustable	Amortization Type
New Business > Define Core Product Attributes >	Floating Rate	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		< Not Applicable >
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name

Location	Default Value	Attribute
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 21: Loan Negative Amortization

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Adjustable Negative Amortization	Amortization Type
New Business > Define Core Product Attributes >	Other Adjustable	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis

Location	Default Value	Attribute
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >	1 Month	Repricing Frequency
New Business > Define Neg Am Attributes >	6 Months	Payment Change Frequency
New Business > Define Neg Am Attributes >	3 Months	Equalization Frequency
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 22: Savings

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if holiday calendar is selected in the preceding section	Rolling Convention

Location	Default Value	Attribute
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Behavior Pattern	Amortization Type
New Business > Define Core Product Attributes >	Floating Rate	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		<Not Applicable>
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

Table 23: Term Deposits

Location	Default Value	Attribute
All Business >	100	Percent Taxable
All Business >	Do Not Adjust	Pay Equivalent Compounding Convention
All Business >	Blank, that is, holiday calendar not selected	Holiday Calendar
All Business >	Unadjusted and Disabled, if the holiday calendar is not selected in the preceding section. Unadjusted and Enabled, if the holiday calendar is selected in the preceding section.	Rolling Convention
All Business >	Shift Dates Only is selected and Disabled if Rolling Convention is not selected. Shift Dates Only is selected and Enabled if Rolling Convention is selected to be other than Unadjusted.	Interest Calculation Logic
New Business > Define Core Product Attributes >	Non-Amortizing	Amortization Type
New Business > Define Core Product Attributes >	Fixed Rate	Adjustable Type
New Business > Define Core Product Attributes	Unchecked	Inflation Indexed Instrument
New Business > Define Payment Attributes >	1 Month	Payment Frequency
New Business > Define Payment Attributes >	Interest In Arrears	Interest Type
New Business > Define Payment Attributes >	Actual / Actual	Accrual Basis
New Business > Define Payment Attributes >	Simple	Compounding Basis
New Business > Define Payment Attributes >	Floating Net Rate	Net Margin Flag
New Business > Define Adjustable Rate Attributes >		<Not Applicable>
New Business > Define Other Mortgage Attributes >	700	Customer Credit Score

Location	Default Value	Attribute
New Business > Define Other Mortgage Attributes >	80	Original Loan to value
New Business > Define Other Mortgage Attributes >	FANNIE_MAE	Issuer
New Business > Define Neg Am Attributes >		<Not Applicable>
New Business> Define Inflation Adjustment Attributes >	0	Index Name
New Business> Define Inflation Adjustment Attributes >	Principal and Interest payments both	Index Adjustment Type
New Business> Define Inflation Adjustment Attributes >	No Floor	No Floor Capital Protection Category

NOTE If the user is mapped to ADCo, the Product Profile will always show the "Define Other Mortgages Attributes" tab.

21 Product Characteristics

This module describes the procedure for working with and managing Product Characteristic rules.

This chapter covers the following topics:

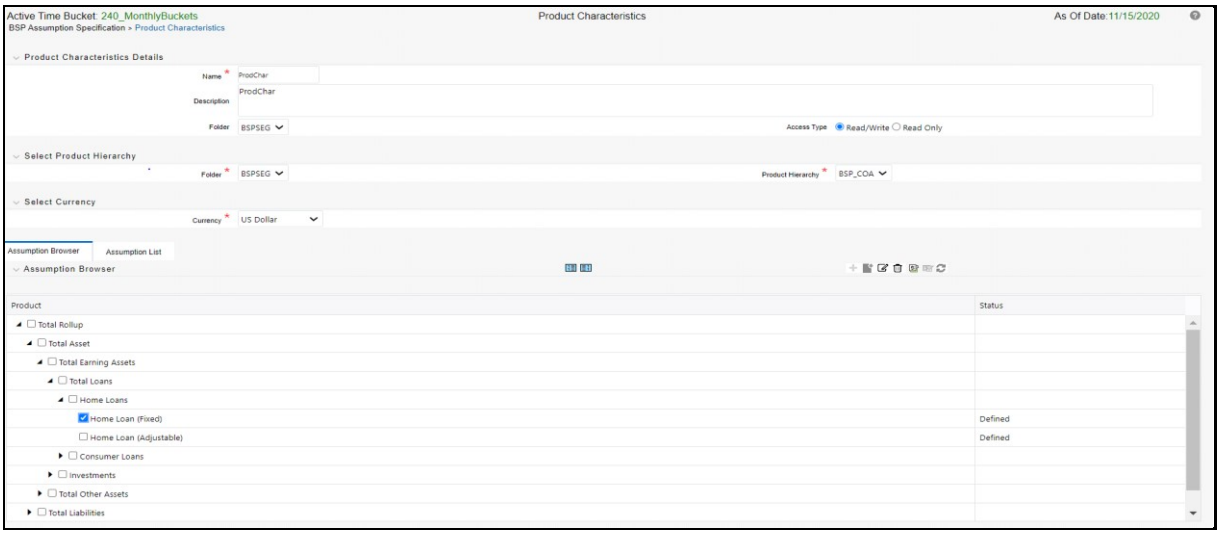
21.1 Creating Product Characteristic Rules

You create a Product Characteristics rule to assign attributes to your products.

Procedure

1. Navigate to the Product Characteristics summary page.
2. Complete standard steps for this procedure.

Figure 122: Product Characteristics



NOTE In addition to the standard steps for creating rules, the procedure for creating Product Characteristics involves one extra step. After Standard Step 6, you need to select a product hierarchy. You can define methodologies at any level of the hierarchical product dimension. The hierarchical relationship between the nodes allows the inheritance of methodologies from parent nodes to child nodes.

21.2 Defining Product Characteristic Rules

The definition of a Product Characteristics rule is part of the Create or Edit Product Characteristics rule process. When you click Save in the Create Product Characteristics rule process, the rule is saved and the Product Characteristics rule summary page is displayed. However, Product Characteristic assumptions have not yet been defined for any of your products at this point. Typically, you would start defining your Product Characteristic assumptions for product-currency combinations before clicking Save.

Defining Product Characteristics Using Node Level Assumptions

Node Level Assumptions allow you to define assumptions at any level of the Product dimension Hierarchy. The Product dimension supports a hierarchical representation of your chart of accounts, so you can take advantage of the parent-child relationships defined for the various nodes of your product hierarchies while defining rules. Children of parent nodes on a hierarchy automatically inherit the assumptions defined for the parent nodes. However, assumptions directly defined for a child take precedence over those at the parent level.

21.2.1 Prerequisites

Performing basic steps for creating or editing a Product Characteristics rule

21.2.2 Procedure

From the Assumption Browser screen, select the product(s) and the currency for which you want to define Product Characteristics and select the “Add New” button to launch the Product Characteristic Details screen.

To define a Product Characteristics rule, complete the following steps:

1. Choose the Currency.

> **NOTE** To define assumptions for all currencies with the selected product, choose the “Default Currency”.

2. From the Assumption Browser, choose the product or products that you want to define.
3. Select the Add Assumption icon.
4. Type a value for each mandatory field. Mandatory input fields are marked with a red asterisk.

> **NOTE** You can optionally select one of the seeded Product Profile templates or a user-defined Product Profile to pre-populate the appropriate Product Characteristic fields.

5. From the File menu, select Save.

TIP Using the default currency to set up assumptions can save data input time. At run time, the calculation engine uses assumptions explicitly defined for a product currency combination. If assumptions are not defined for a currency, the engine uses the assumptions defined for the product and the default currency. If the assumptions are the same across some or all currencies for a specific product, you can input assumptions for the default currency. Be careful using this option on screens where an Interest Rate Code is a required input. In most cases, you will want to use currency-specific interest rate curves for pricing instruments within each specific base currency. The Default Currency option, if used will apply a selected Interest Rate Code across all currencies.

21.2.3 Assumption List Tab

The Assumption List Tab is present next to the Assumption Browser in all the screens which have the assumption browser. This tab provides search capability with the help of five fields:

- Dimension Member Code
- Dimension Member Name
- Dimension Member Description
- Dimension Member Status
- Is Leaf

Dimension Member Code, Name, and Description provide filter criteria for search such as Contains, Starts With, Ends With, Exactly Matches.

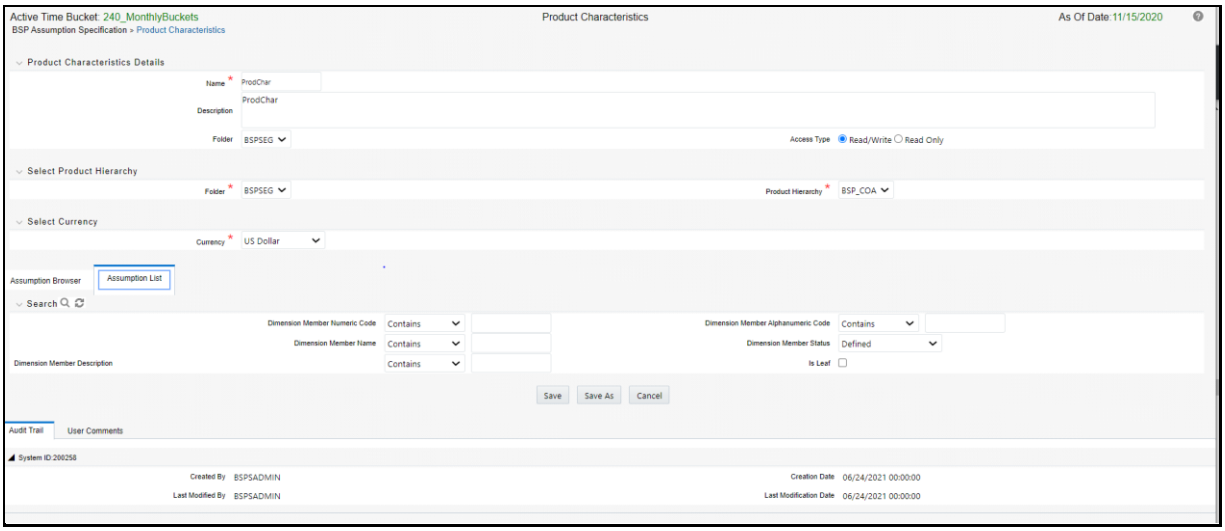
Dimension Member Status is a drop-down list containing values such as Defined, Not Defined, Inherited, Defined and Inherited, and All.

Is Leaf is a check box that can be toggled.

The Search button initiates a search on the assumption browser based on the filter criteria provided in the above-mentioned fields. Reset restores default search criteria.

The search results will flatten the hierarchy and display all of the products that meet the input criteria. Use the pagination widget to display the number of products per page (up to a maximum of 99). You can proceed to edit or create new rules in the assumption list tab.

Figure 123: Assumptions List Tab



21.2.4 The Product Characteristic Details Screen

The details screen has three input tabs.

- All Business
- New Business
- Model Integration

> **NOTE** The Model Integration tab will be available only if Moody's structured cashflow library integration is done with BSP.

21.2.4.1 The All Business tab

Assumptions made on the All Business tab apply to both current position data and new business balances.

The common Product Characteristic fields listed on the All Business tab are as follows:

Table 24: Common Product Characteristic Fields List for All Business Tab

Field	Behavior
Option Adjusted Spread	The option-adjusted spread is used during stochastic processing only. It is an adjustment to the stochastic discount factor used in calculating market value and value at risk. Valid values for this spread are between -5.000% and 5.000%, but a value less than 2.00% is recommended for best results. For more information about the calculation of discount factors, see the Oracle Financial Services Cash Flow Engine Reference Guide. **Note**: BSP does not support stochastic processing.

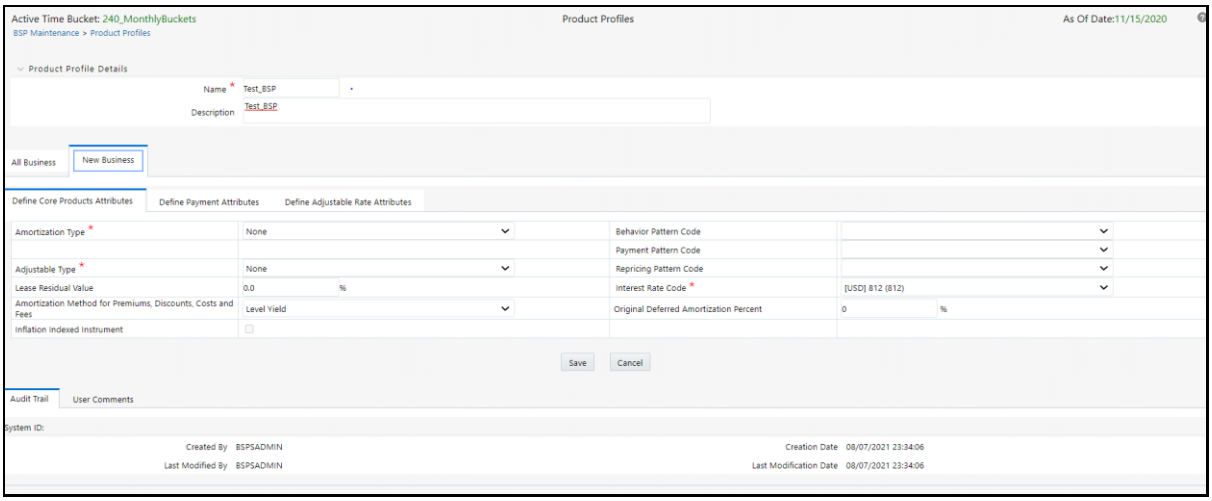
Field	Behavior
Model with Gross Rates	If your institution has outsourced loan serving rights for some of your assets (most typically mortgages), the rates paid by customers on those assets (gross rates) will be greater than the rates received by your bank (net rates). For these instruments, both a net and gross rate will be calculated within the cash flow engine and both gross and net rate financial elements will be output. The gross rate is used for prepayment and amortization calculations. The net rate is used for income simulation and the calculation of retained earnings in the auto-balancing process. **Note**: Modelling with gross rates is not supported in BSP.
Interest Credited	This option allows interest payments to be capitalized as principal on simple/non-amortizing instruments.
Percent Taxable	Percent Taxable specifies the percent of income or expense that is subject to the tax rates defined in the active Time Bucket rule. This is used with the Auto-balancing option in the ALM Process rules. Percent taxable should be set up for each product and reporting currency or product and default currency combination. **Note**: Percent taxable is not used in BSP
Currency Gain/Loss Basis	Currency Gain/Loss Basis determines how exchange rate fluctuations are reflected in financial element results for each product and currency combination. The choices are: • Temporal • Historical Basis • Current Rate See the Oracle Financial Services Cash Flow Engine Reference Guide for more information on the cash flow calculations associated with currency gain/loss recognition techniques. **Note**: Only used in ALM consolidated currency runs; not supported in BSP.
Pay Equivalent Compounding Convention	In most cases, interest rates are not adjusted for the differences in pay-basis between the quote basis of the pricing index and the payment frequency of the account to which the index is assigned. Some instruments, notably Canadian Mortgages, follow a convention that the interest rates are adjusted. In this case, the Pay-Equivalent Compounding Convention should be set to Semi-Annual Quoting Convention. For other accounts, the convention should be set to Do Not Adjust.
Holiday Calendar	The default value is Blank and is Enabled. This drop-down list contains the list of all holiday calendar definitions defined in the Holiday Calendar UI.

Field	Behavior
Rolling Convention	The default value is Unadjusted and is Enabled, only when Holiday Calendar has been selected in the preceding field. This drop-down list contains four values: Unadjusted Following Business Day Modified following business day Previous business day Modified previous business day Actual/Un-adjusted Payment on an actual day, even if it is a non-business day. Following Business Day The payment date is rolled to the next business day. Modified following business day* The payment date is rolled to the next business day unless doing so would cause the payment to be in the next calendar month, in which case the payment date is rolled to the previous business day. Previous business day The payment date is rolled to the previous business day. Modified previous business day* The payment date is rolled to the previous business day unless doing so would cause the payment to be in the previous calendar month, in which case the payment date is rolled to the next business day *Many institutions have month-end accounting procedures that necessitate this.
Interest Calculation Logic	There are two options: • Shift Dates Only Recalculate Payment

NOTE The holiday calendar attributes can be applied directly to the instrument records for an existing business. If they are not applied on the records, the engine will use the definition from the all-business tab to apply a holiday calendar for existing and new businesses.

21.2.4.2 The New Business Tab

Figure 124: New Business Tab



Assumptions made on the New Business tab impact forecast business only. These assumptions are used together with the other Forecast Assumption rules including Forecast Balances, Pricing Margins, and Maturity Mix to determine the behavior of your forecast instruments. There are five sub-tabs within the New Business setup including:

- Define Core Product Attributes
- Define Payment Attributes
- Define Adjustable Rate Attributes
- Define Negative Amortization Attributes
- Define Other Mortgage Attributes *
- Define Inflation Adjustment Attributes **

> **NOTE**
>
> * This tab will be displayed only if you are mapped to ADCo LDM functionality and currency is selected as USD.
>
> ** This tab will be displayed, if the Inflation-Indexed Instrument option is selected in Define Core Products Attributes tab for New Business.

21.2.4.3 Relationship Triggers

There are dependencies built into the tabular structure of this screen. Based on assumptions made in the first two tabs, the remaining two tabs may not be active.

Table 25: Relationship Triggers Fields, Values, and Behavior

Field	Value	Behavior
Amortization Type Code	Conv. Fixed, Conv Adjust., Adjst/Ng Amrt	Always interest in arrears, therefore, disables Interest Type
Amortization Type Code	Conv. Fixed, Rule-of-78's	No repricing occurs, therefore disables the Define Negative Amortization Attributes and enables the Adjustable Rate Attributes tab. In this case, Rate Change Rounding Type, Rate Change Rounding Factor (when there is Rounding), Rate Floor Life, and Rate Cap Life fields will be enabled in the Adjustable Rate Attributes tab.
Amortization Type Code	Adjst/Ng Amrt	Enables Negative Amortization Attributes tab
Amortization Type Code	Payment Pattern	Enables the Payment Pattern drop list
Amortization Type Code	Behavior Pattern	Enables the Behavior Pattern drop list
Amortization Type Code	Conv Fixed, Conv Adjust., Level Principal, Non Amortizing	An inflation-Indexed Instrument check box will be enabled
Adjustable Type Code	Other Adjustable, Fixed Rate, Floating Rate, or Repricing pattern	Repricing Frequency is not applicable, or it is defined elsewhere, therefore disables Repricing Frequency and Multiplier. Enables the Adjustable Rate Attributes tab When the Adjustable Type Code is Fixed, the Adjustable Rate Attributes tab is enabled. In this case, Rate Change Rounding Type, Rate Change Rounding Factor (when there is Rounding), Rate Floor Life, and Rate Cap Life fields will be enabled in the Adjustable Rate Attributes tab.
Adjustable Type Code	Repricing Pattern	Enables the Repricing Pattern drop list. In addition, several of the repricing attributes are defined elsewhere, therefore they are disabled in this rule. Only periodic increase and decrease, rate change min, and rounding are enabled
Repricing Frequency	"0"	No repricing occurs, therefore disables Adjustable Rate Attributes
Model with Gross Rates	Off	Net Margin Flag options are only necessary when modeling with different gross rates and net rates, therefore disables Net Margin Flag. **Note**: This is not supported in BSP.
Rate Change Rounding Type	"No Rounding" or "Truncate"	Rounding does not apply, therefore disables Rate Change Rounding Percent
Currency		Allows display of Interest Rate Codes and Transfer Rate Interest Rate Codes for which the selected currency is the reference currency. In Product Characteristics, Default Currency allows all Interest Rate Codes, regardless of currency

21.2.4.3.1 New Business Fields

Following is a listing of new business fields used in the Product Characteristics rule > Core Product Attributes tab.

Figure 125: Core Product Attributes Tab

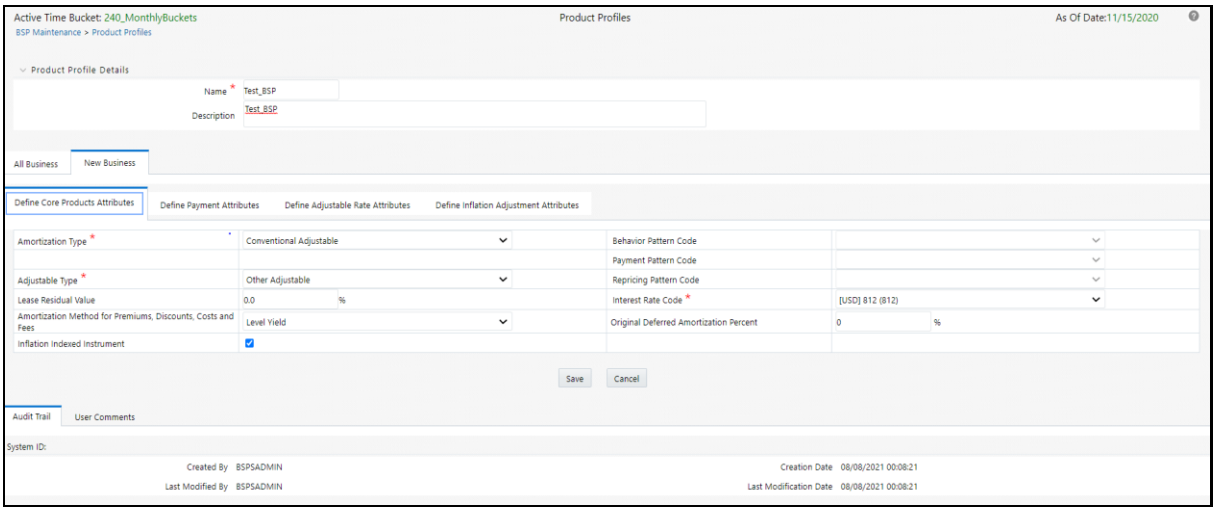


Table 26: Core Product Attributes Tab Fields and Descriptions

Field	Description
Amortization Type	Method of amortizing principal and interest. The choices consist of all standard OFSAA codes and all additional user-defined codes created through the Payment Pattern and Behavior Pattern interfaces, as given below: • Conventional Fixed • Conventional Adjustable • Balloon Payment • Adjustable Negative Amortization • Non-Amortizing • Rule of 78's • Level Principal • Payment Pattern • Behavior Pattern • Lease
Adjustable Type	Determines the repricing characteristics of the new business record. The choices consist of all standard OFSAA codes plus a Repricing Pattern. The standard OFSAA codes are as follows: • Fixed-Rate • Floating Rate • Other Adjustable
Lease Residual Value	For Lease instruments, this value specifies the residual amount as a percent of the par balance.

Field	Description
Amortization Method for Premiums, Discounts, and Fees	Determines the method used for amortizing premiums, discounts, or fees. The available codes are: • Level Yield • Straight Line
Behavior Pattern Code	Lists all user-defined behavior patterns created through the user interface.
Payment Pattern Code	Lists all user-defined payment patterns defined through the user interface.
Repricing Pattern Code	Lists all user-defined reprice patterns created through the user interface.
Interest Rate Code	Defines the pricing index to which the instrument interest rate is contractually tied. The interest rate codes appear as a selection option depending on the choice of currency. The interest rate code list is restricted to codes that have the selected currency as the reference currency. If the default currency is chosen, all interest rate codes are available as a selection.
Original Deferred Amortization Percent	The initial deferred balance is expressed as a percent of the original par balance.
Inflation-Indexed Instrument	Check box to model instrument as Inflation-Indexed.

Following is a listing of new business fields used in the Product Characteristics rule > Payment Attributes tab:

Figure 126: Payment Attribute Tab

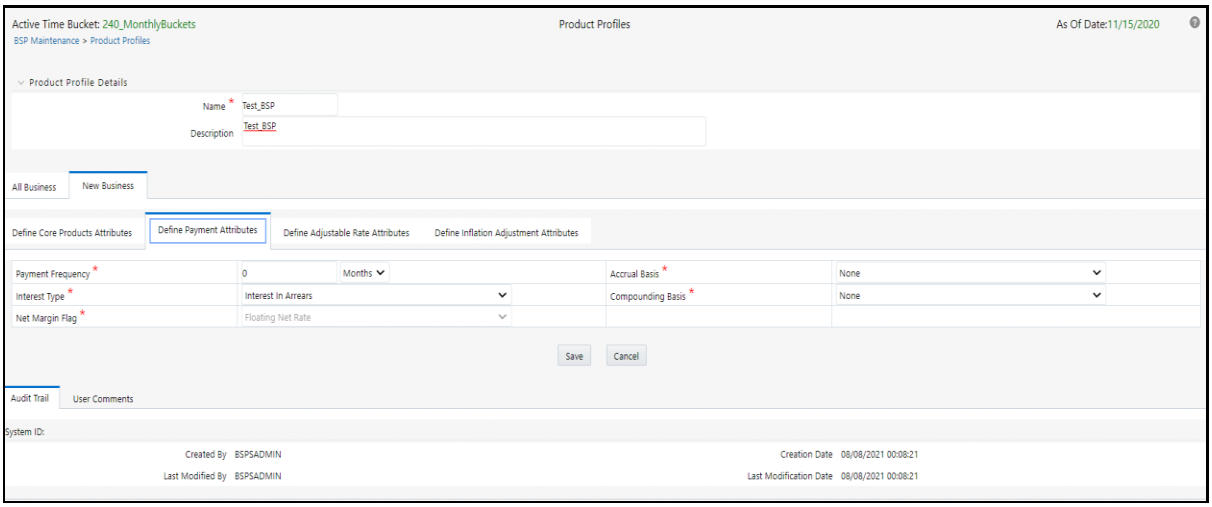


Table 27: Payment Attributes Tab

Field	Description
Payment Frequency	Frequency of payment (P & I), Interest or Principal). For bullet instruments, use zero.

Field	Description
Interest Type	Determines whether interest is calculated in arrears or advance or if the rate is set in arrears. There are three interest types: • Interest in Arrears • Interest in Advance • Set in Arrears For conventional amortization products, interest in arrears is the only valid choice.
Rolling Convention	Reserved for future use.
Accrual Basis	The basis on which the interest accrual on an account is calculated. The choices are as follows: • 30/360 • Actual/360 • Actual/Actual • 30/365 • 30/Actual • Actual/365 • Business/252 *
Compounding Basis	Determines the number of compounding periods per payment period. The choices are the following: • Daily • Monthly • Quarterly • Semi-Annual • Yearly • Continuous • Simple • At Maturity
Net Margin Flag	The setting of the net margin flag affects the calculation of the net rate. The two settings are: • Floating Net Rate - the net rate reprices in conjunction with the gross rate, at a value net of fees. • Fixed Net Rate - the net rate equals a fixed fee equal to the net margin.

NOTE

* A Holiday calendar selection is required if a business/252 accrual basis is selected. Business/252 accrual basis is only applicable to the recalculate option of the holiday calendar rule. If the user selects the shift payment dates, the payment will still be recalculated for the non-holiday/weekend date.

Following is a listing of new business fields used in the Product Characteristics rule > Adjustable Rate Attributes tab:

Table 28: Adjustable Rate Attributes tab

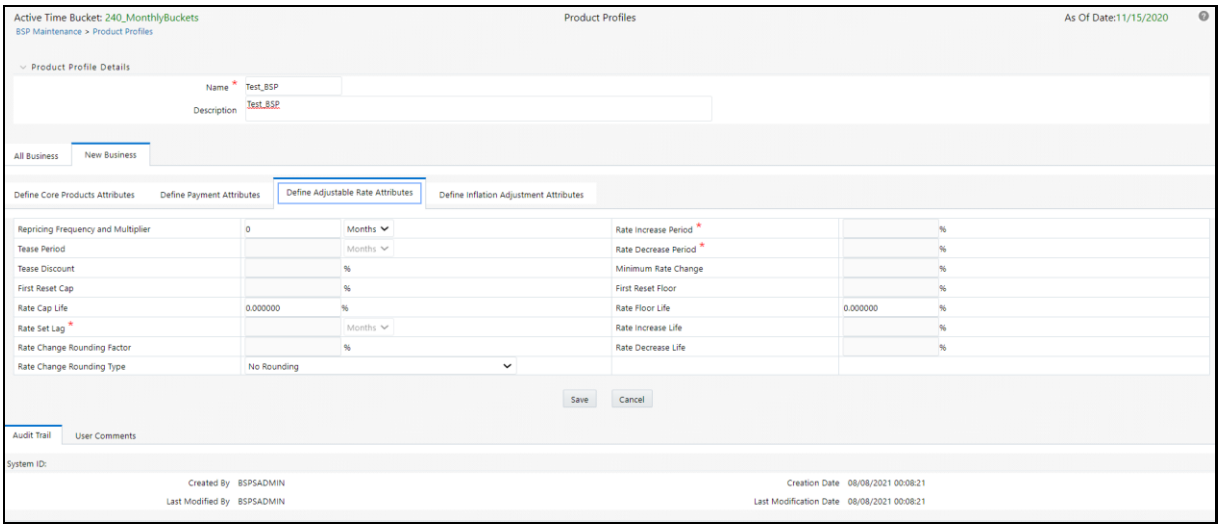


Table 29: Adjustable Rate Attributes Tab Fields andDescriptions

Field	Description
Repricing Frequency	Contractual frequency of rate adjustment
Tease Period	The tease period is used to determine the length of the tease period.
Tease Discount	The tease discount is used in conjunction with the original rate to calculate the tease rate. The tease rate is the original rate less the tease discount.
First Reset Cap	This indicates the maximum delta between the initial rate and the first reset for mortgage instruments that have a tease period. This rate will be applicable at the tease end period, before the first reset. After this, the periodic and lifetime cap value will be applied. The value of this field will be automatically populated from the Product Profile window if the product is mapped to Product Profile and the value is defined for First Reset Cap. For example: Current Rate = 3.5% (from the instrument record) Margin = 0.3 % First Reset Cap = 0.5% (from the instrument record) First Reset Floor = 0.1% (from the instrument record) Scenario 1: If New Forecasted Rate = 5.1% (Forecast Rates Assumption) Fully indexed rate (after applying minimum rate change, rounding effects) is higher than the (Current Rate + First Reset Cap). So, the new rate assigned will be 3.5% + 0.5% = 4.0%

Field	Description
First Reset Floor	This is the initial minimum value for mortgage instruments that have a tease period. This floor rate will be applicable at the tease end period, before the first reset. After this, the periodic and lifetime floor value will be applied. The value of this field will be automatically populated from the Product Profile window if the product is mapped to Product Profile and value is defined in for First Reset Floor.
Rate Cap Life	The maximum rate for the life of the instrument.
Rate Set Lag	Period by which the rate lookup lags the repricing event date.
Rate Change Rounding Factor	Percent to which the rate change on an adjustable instrument is rounded.
Rate Change Rounding Type	The method used for rounding of interest rate codes. The choices are as follows: no rounding, truncate, round up, round down, round nearest.
Rate Increase Period	The maximum interest rate increase allowed during the cycle on an adjustable-rate instrument.
Rate Decrease Period	The maximum amount rate can decrease during the repricing period of an adjustable-rate instrument.
Minimum Rate Change	The minimum required change in rate on a repricing date.
Rate Floor Life	The minimum rate for the life of the instrument.
Rate Increase Life	Maximum interest rate increase allowed during the life of an adjustable-rate instrument used to calculate rate cap based on forecasted rate scenario. If both rate increase life and rate cap are defined, the process uses the more restrictive rate.
Rate Decrease Life	The maximum amount rate can decrease during the life of an adjustable-rate instrument, used to calculate the rate floor based on the forecasted rate scenario. If both rates decrease the life and rate floor are defined, the process uses the more restrictive rate.

Following is a listing of new business fields used in the Product Characteristics rule > Negative Amortization Attributes tab:

Figure 127: Negative Amortization Attributes Tab

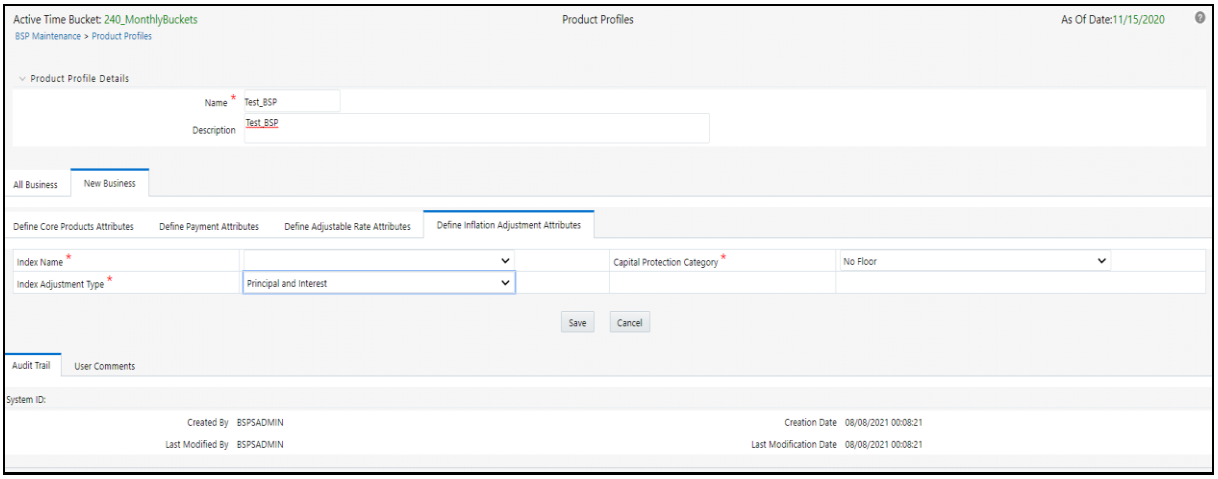


Table 30: Negative Amortization Attributes Tab Field and Descriptions

Field	Description
Payment Change Frequency	The frequency at which the payment amount is recalculated for adjustable negative amortization instruments.
Equalization Frequency	The frequency at which the current payment is necessary to fully amortize the instrument is re-computed.
Payment Decrease Life	Maximum payment decrease allowed during life of a negative amortization instrument.
Payment Decrease Period	Maximum payment decrease allowed during a payment change cycle of a negative amortization instrument.
Equalization Limit	Maximum negative amortization allowed, as a percent of the original balance. For example, if the principal balance should never exceed 125% of the original balance, this column would equal 125.0
Payment Increase Life	Maximum payment increase allowed during the life of a negative amortization instrument.
Payment Increase Period	Maximum payment increase allowed during a payment change cycle on a negative amortization instrument.

Following is a listing of new business fields used in the Product Characteristics Rules, Define Other Mortgage Attributes tab:

Table 31: Business Fields in Product Characteristics Rules

Field	Description
Customer Credit Score	The default value of this is 700 and it should be in the range of 300-850. The value of this field will be automatically populated from the Product Profile window if the product is mapped to Product Profile and value is defined for Customer Credit Score.
Original Loan To Value	The default value of this is 80 and it should be in the range of 1-300. The value of this field will be automatically populated from the Product Profile window if the product is mapped to Product Profile and value is defined for Original Loan To Value.
Issuer	Select the name of the Issuer. The default value is FANNIE_MAE.
Prepayment Index	This is the first index value fetched by the UI among the defined ADCo Curves.

Note: This tab will be displayed if ADCo LDM mapping is done, and if the selected currency is USD and the product is of account type “Earning Assets”.

21.2.4.4 The Model Integration tab

This tab allows you to define the assumptions based on Moody's structured cashflow library integration for All Business and New business balances.

This tab will be displayed only if you have installed Moody's structured cashflow library. Following are the prerequisites to view the “Model Tuning” tab:

- Moody's structured cashflow library installed on the setup
- Moody's structured cashflow library enabled for the specific user
- Product is securitized products or loans

You can tune the model using the Tune option. Select the model from the Model Selection drop-down list and click Tune. Following modeling options are available in the Model Selection drop-down list:

- None
- Source System Provided
- ADCo

Based on the selected model, the UI parameters will vary.

21.2.4.4.1 Source System Provided

Table 32: Source System Provided Fields and Behaviors

Field	Behavior
Prepayments	This is the magnitude of the prepayment rate. The default value of this is 1, and it should be greater than 0.
Default	This is the magnitude of the default rate. The default value of this is 1, and it should be greater than 0.
Recovery	This is the magnitude of the recovery rate. The default value of this is 1, and it should be greater than 0.
Recovery Lag	This is the recovery lag applied to each loan. The default value of this is 0, and the value range is 1 to 100.
Servicer Advancing	Select the servicer advancing as None, Interest, or Both. The default value of this is None.
Draw Rates	This is the magnitude for mortgage Draw rates. The default value of this is 1, and it should be greater than 0.

21.2.4.4.2 ADCo

Enter values in these parameters if you want to use ADCo LDM integration along with Moody's Structured Cash Flow library.

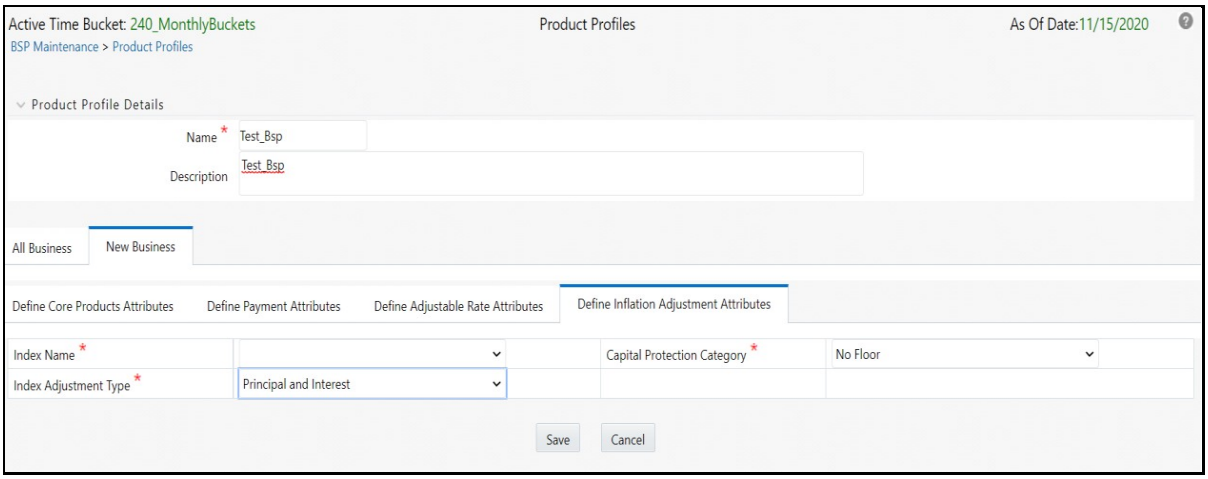
Table 33: ADCo LDM Integration with Moody's Structured Cash Flow Library

Field	Behavior
SMM for Failed Loans	This is the failed loan's SMM in percentage. The default value of this is 0 and it should be in the range of 0-100.
MDR for Failed Loans	This is the failed loan's MDR in percentage. The default value of this is 0 and it should be in the range of 0-100.
Recovery for Failed Loans	This is the failed loan's recovery in percentage. The default value of this is 0 and it should be in the range of 0-100.

Field	Behavior
Subprime FICO Loans	The loan is considered subprime if FICO is less than this value (620 if not provided). The default value of this is 620 and it should be in the range of 300-850.
FICO to use(if not available)	FICO to use for loans that do not have this information. The default value of this is 680 and it should be in the range of 300-850.

21.2.4.5 Define Inflation Adjustment Attributes Tab

Figure 128: Inflation Adjustment Attributes Tab



When the Inflation-Indexed Instrument check box is selected, the Define Inflation Adjustment Attributes tab is enabled. For more information on Inflation-Indexed Instrument calculation, see Oracle Financial Services Cash Flow Engine Reference Guide.

> **NOTE** The Define Inflation Adjustment Attributes tab will be enabled if the Adjustment type is selected as Conventional Adjust, Conventional Fixed, Level principal, or Non-Amortizing.

Figure 129: Define Inflation Adjustment Attributes Tab

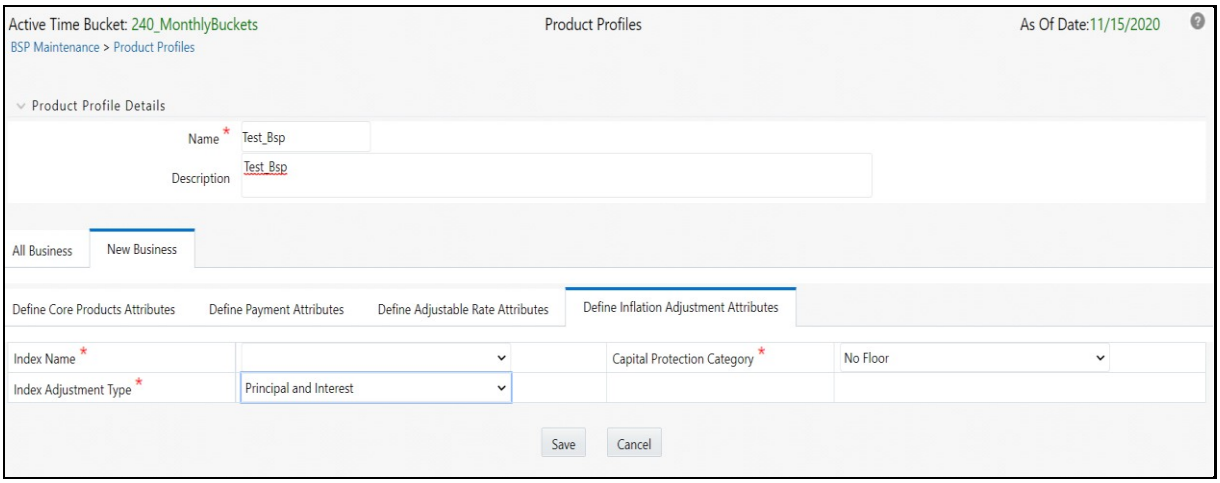


Table 34: Tabs, Fields, and Behavior of Inflation Adjustment Attributes

Tab	Field	Behavior
Index Adjustment Attributes	Index Name	Lists all Economic Indicator defined through the user interface.
Index Adjustment Attributes	Capital Protection Category	Determines Capital protection to be provided to Inflation-indexed instruments. The choices are: • No Floor: No Floor does not provide any downside protection. • The floor of 1: Floor of 1 protects downside movement. • Max during Life: Max during life gives maximum advantage using maximum Index factor for calculation.
Index Adjustment Attributes	Index Adjustment Type	Determines the type of Index adjustment. The choices are following: • Principal and Interest • Principal Only • Interest Only

NOTE For more information on cash flow calculations associated with Inflation-indexed instruments, see Oracle Financial Services Cash Flow Engine Reference Guide.

21.3 Copying Assumptions across Currencies and Products

This functionality provides you with the option to copy, in total or selectively, the product assumptions contained within the BSP assumption rules from one currency to another currency or a set of currencies, or from one product to another product or set of products.

Copy of assumptions enhances the usability of Oracle Balance Sheet Planning in a multi-currency environment. For example, if you have 10 currencies enabled in the application, you need to input only one set of assumptions and then copy those assumptions across all enabled currencies, instead of having to input 10 full sets, thereby saving a significant amount of input time.

This functionality also reduces the risk associated with data input errors as you need to audit inputs for just a single set of assumptions before executing the copy procedure. The copy across currencies process requires users to select a replacement yield curve for each target currency. These currency-specific IRC's replace the IRC selection made for each product in the source currency selection set. It is possible to edit the target assumptions after the initial copy processes have been completed.

21.3.1 Prerequisite

Define BSP rule-related product assumptions. See:

- Overview of Product Characteristic Rules
- Overview of Prepayment Rules
- Overview of Maturity Mix Rules
- Overview of Pricing Margin Rules
- Overview of Transfer Pricing Rules
- Overview of Adjustment Rules

21.3.2 Procedure

Use the following procedure to copy assumptions across currencies or products:

1. Navigate to the appropriate BSP business rule assumption browser.
2. Define assumptions for the source currency/product set.
3. Save the assumptions.
4. Select the defined product assumptions using the check boxes corresponding to each product (or Node on the hierarchy) that you want to include in the copy process.
5. Click the Copy Across icon.
6. On the Copy Across details page, select the listed currencies either individually using the corresponding check boxes or in total using Select All.
7. Specify an interest rate code for each selected currency. This is necessary because each interest rate code is specific to a single currency. When copying product assumptions across currencies, you must define the interest rate code for each target currency to replace the interest rate code used for the source currency assumptions.

NOTE

While defining a rule if IRC is required, then Copy Across (currency) UI will have an option to select the IRC. For example, Product Characteristic, Discount Methods, Prepayments, Transfer Pricing Rules, Adjustment Rules UIs, the Copy Across (Currency) UI will have an option for IRC selection.

While defining a rule if IRC selection is not required, then Copy Across (Currency) will have the IRC selection option disabled. For example, Forecast Balances, Maturity Mix, Pricing Margin UIs, the Copy Across (Currency) UI will not have an option for IRC selection.

If a rule does not require the IRC selection and RDP selection is required (for, Forecast Balances, Maturity Mix, Pricing Margin), then Copy Across (Currency) will not have an option to select the IRC.

8. Click Apply to initiate the copy process and to return to the Assumption Browser page.

NOTE

You can review the results of the copy process from the Assumption Browser by selecting a different currency and following the usual navigation to view or edit assumptions. The application displays new assumptions for each product included in the original source selection. The copy process replaces pre-existing assumptions for any product-currency combination that is included in the target selection.

9. Click Save on the Assumption Browser page to save the assumptions to the database.

22 Forecast Rate Scenarios

Forecast Rate scenario assumptions allow you to define future interest rates, future economic indicators, and future currency exchange rates. Use interest rate forecasts to project cash flows, including pricing new business, re-pricing existing business, calculating prepayments, and determining discount methods. Use Economic Indicator forecasts to include in behavioral modeling and scenario/stress analysis. Use currency exchange rate forecasts to account for the effects of currency fluctuations on income.

The Forecast Rate assumptions use interest rate, economic indicator, and currency codes defined in Rate Management, including all the active and reporting currencies and the primary, or functional, currency at your institution. See OFSAA Rate Management for information on how to define interest rates, economic indicators, and currency exchange rates.

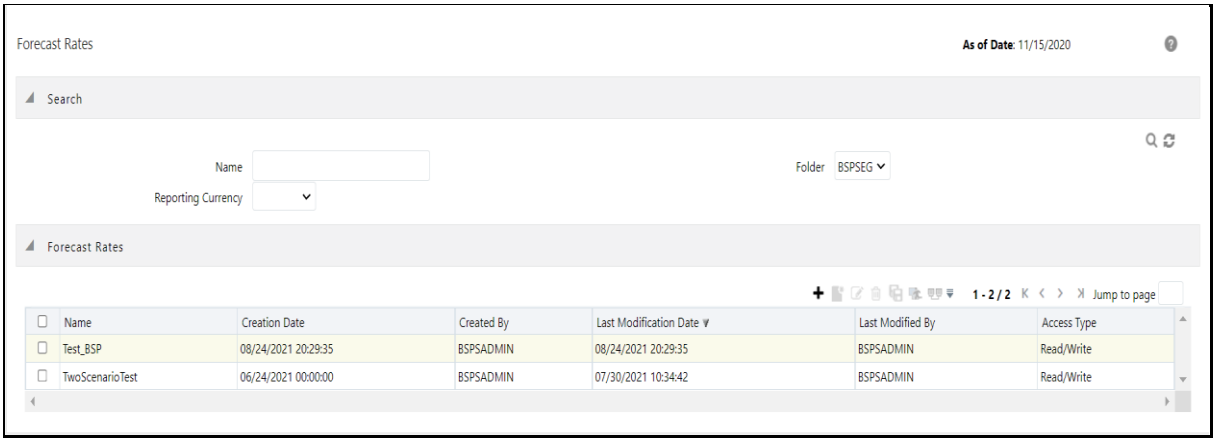
This module describes how to create a Forecast Rates assumption rule to forecast cash flows and, if you work with multiple currencies, to model relationships between interest rates and exchange rates.

This chapter covers the following topics:

22.1 Creating a Forecast Rates Assumption Rule

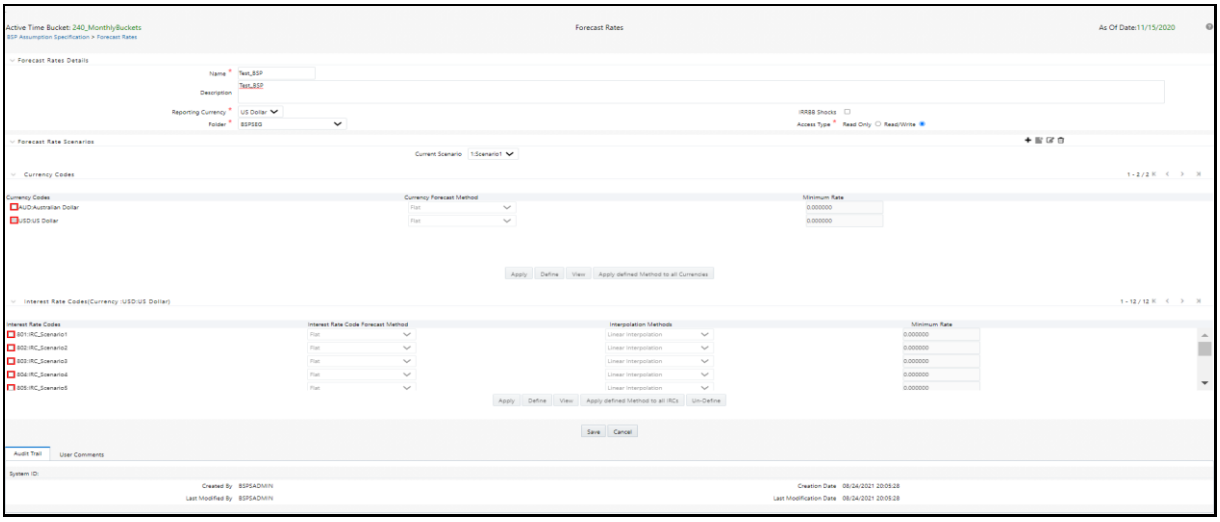
1. From the Forecast Rates bar, select the “Add” icon.

Figure 130: Forecast Rates Summary Page



2. Type a descriptive name for the rule.
3. Type a description for the rule. This is an optional field.
4. Select a reporting currency.
5. Select a folder.
6. Select the Access Type option.
7. Click Save.

Figure 131: BSP Assumption Specification – Forecast Rates



22.1.1.1 Features of Forecast Rates

The reporting currency you selected when creating the Forecast Rates assumption rule appears in the title bar. Each forecast scenario you create, up to ninety nine will appear under Current Scenarios. Forecast scenarios use the date buckets specified in the active Time Bucket Rule. You can also set minimum rates (or floors) on any rule created for Currency, Economic, or Interest Rate. For example, if you want to run a -200bp rate scenario, with short-term rates < 2%, you can set the minimum rate to the floor at 0%, although negative rates are allowed if desired.

Here, you have the following options available for defining Forecast Rate Scenario:

- Standardized Approach
- Enhanced Approach

IRRBB Standardized Approach Shocks allows users to select one of the six Standardized Approach Shocks (SAS) in a forecast rates scenario for certain currency IRCs. You can select the following shock scenarios:

- Standardized Approach Shock - Parallel UP
- Standardized Approach Shock - Parallel DOWN
- Standardized Approach Shock - Short UP
- Standardized Approach Shock - Short DOWN
- Standardized Approach Shock - Flattener

- Standardized Approach Shock - Steppener

These options will be available for supported currencies. If an IRC is for a non-supported currency, then these would not display.

For more information, see the Cash Flow Engine reference Guide.

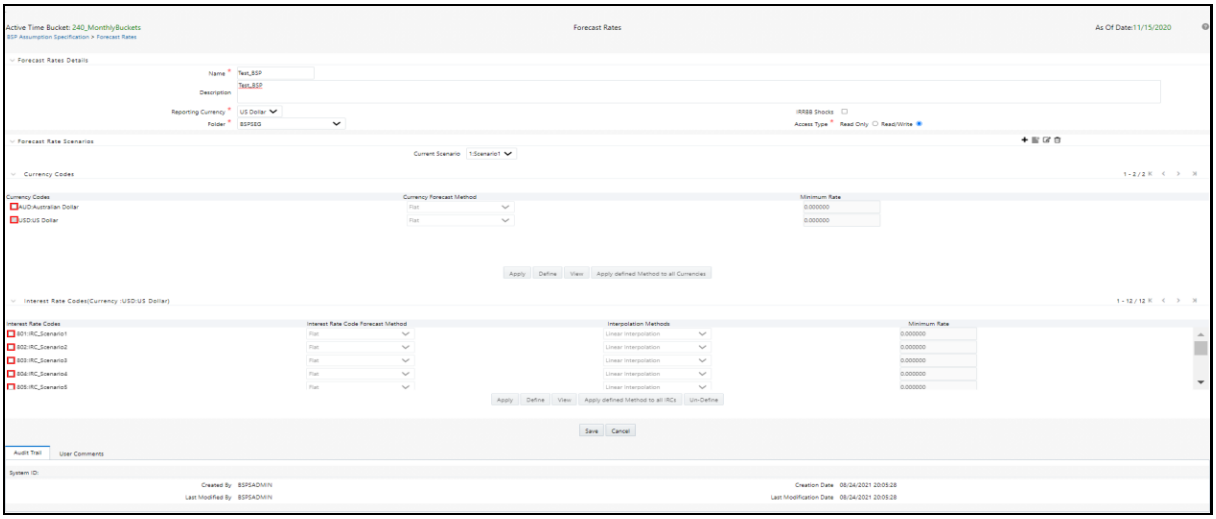
The active currencies defined under Rate Management > Currencies, are listed under the Currency Codes section. The selection under Currency Codes defaults to the reporting currency when you are not forecasting exchange rates. The list of IRCs under the Interest Rate Codes section is dependent on the selected currency. The IRCs, including a reference IRC for each currency, are loaded from Rate Management. When you select a currency other than the reporting currency, the options under Currency Forecast Method provide several ways to model relationships between exchange rates and interest rates.

The Economic Indicators for all active indices are listed in the Economic Indicator section. These indices are not dependent upon the currency selected. Use these indicators to set up scenarios around changing economic conditions that will affect the forecast outcome of another variable. For example, if you forecast a higher GDP, you may have a scenario where new business volume is tied to that GDP outcome, which could be different than a lower GDP scenario. The Economic Indicators are created and maintained from Rate Management.

The IRCs for all active currencies (and reporting currencies, a subset of the active currencies) are listed under Interest Rate Codes. The options under Interest Rate Code Forecast Method provide several ways to model the effects on portfolio cash flows due to interest rate changes.

You can map your forecast scenario with Behavior Pattern Rule. For more information, see the Behavior Pattern Mapping section.

Figure 132: Forecast Rates Features



22.2 Currency Forecast Methods

The following currency forecast methods are available when you select a currency (other than the reporting currency) from the Currency Codes list.

- **Flat**: Forecast no change in the exchange rate for all dates beginning with the as-of date.
- **Structured Change**: Forecast exchange rates as an incremental change from the previous period.
- **Direct Input**: Type exchange rates to use in forecasting.
- **Parity ***: Forecast the exchange rate between two currencies based on interest rate forecasts for the reference IRC associated with each of the currencies.
- **No Arbitrage ***: Forecast the exchange rate required to maintain a no-arbitrage condition between two currencies.

* The above methods are available when the selected currency has an associated reference IRC as defined in Rate Management.

You can map your forecast scenario with Behavior Pattern Rule. For more information, see Behavior Pattern Rule Mapping.

Examples of Currency Forecasting

The examples below use the following data to demonstrate currency forecast methods:

- Reporting currency = U. S. dollars (USD is shown in the title bar)
- Local currency = Australian dollars – (converting from Australian dollars (AUD) to USD)
- Exchange rate loaded from Rate Manager = 1.108 AUD to 1 USD (rate in effect on the as-of date, 06/30/09)
- Modeling period = 07/01/2009 to 06/30/2010

To Begin: For all examples, begin by doing the following:

1. Create a new Forecast Rates assumption rule with USD as the reporting currency.
2. In the Forecast Rates window, add (or rename) a scenario:
   - Click Add (or Rename).
   - Type a name for the scenario.
   - Click Apply.

Flat Method: Calculate the exchange rate of Australian dollars to $1 U. S., modeling no change in the exchange rate during the modeling period.

In the Forecast Rates window, do the following:

1. From Currency Codes, select AUD: Australian Dollar.
2. From Currency Forecast Method, click Flat.
3. Click View.

   Under Rate Value, you will see the exchange rate: AUD 1.108 s equals USD 1. This rate is applied uniformly to all date buckets, based on the Rate in Effect at the As-of Date in your Application Preferences.

Figure 133: Forecast Rates

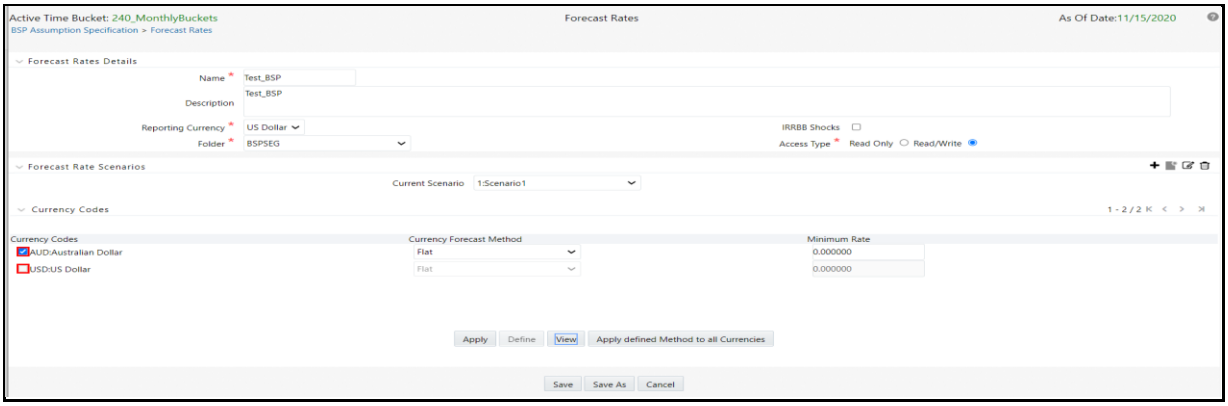


Figure 134: Forecast Rates

4. Click OK.
5. At the bottom of the page, click Save.

Structured Change: Model a change in the exchange rate so that the rate increases by a total of 0.5% over four months, levels off for four months, and then drops a total of 0.25% over three months.

In the Forecast Rates window, do the following:

1. From Currency Codes, select AUD: Australian Dollar.
2. From Currency Forecast Method, select Structured Change.
3. Click Define.
4. Add rows and type bucket numbers and rate changes as follows:
5. You can also use the Excel import/export feature to add the rate changes.
6. Click Apply.
7. Click View.
8. Click OK.
9. At the bottom of the page, click Save.

Direct Input: Model a change in the exchange rate so that rates reflect a stronger U. S. dollar during the spring of 2010.

In the Forecast Rates window, do the following:

1. From Currency Codes, select AUD: Australian Dollar.
2. From Currency Forecast Method, select Direct Input.
3. Click Define.
4. Click Apply.
5. Click View to see the output table.

Figure 135: Forecast Rate Changes

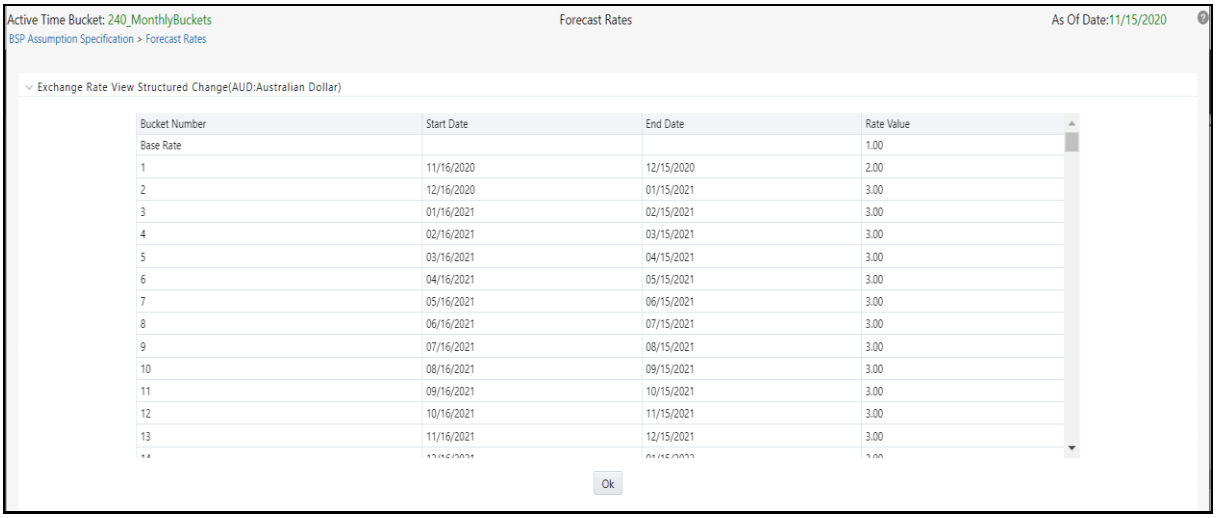
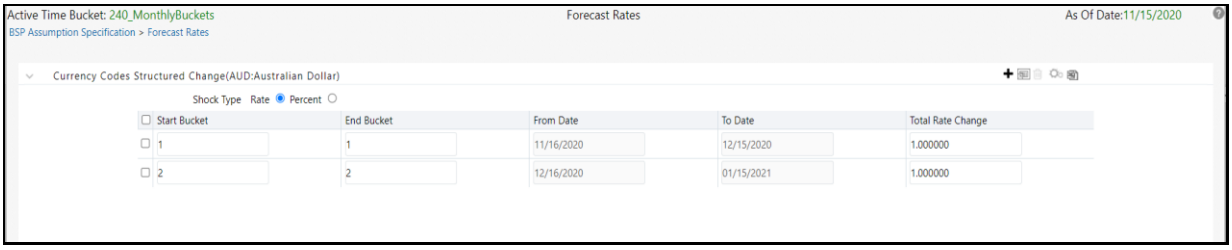


Figure 136: Forecast Rates – Currency Codes Structured Change



6. You can also use the Excel import/export feature to add the rate values.
7. Click OK.
8. At the bottom of the page, click Save.

Parity: Model a period of rising interest rates for the U. S. and Australian dollars. Use the parity method to forecast the exchange rate of Australian dollars to $1 U. S. Parity is calculated based on the forecast interest rates of the reference IRCs of the Australian dollar and the U. S. dollar.

1. In the Forecast Rates window, forecast changes in the U. S. dollar interest rate:
2. From Currency Codes, select USD: US Dollar.
3. From Interest Rate Codes, select Treasury Index.
4. From Rate Forecast Method, click Direct Input.
5. Click Define.

6. Type interest rate changes for 02/01/2010 through 04/30/2010.
7. Click Apply.

In the Forecast Rates window, forecast changes in the Australian dollar reference Interest rate:

1. From Currency Codes, select AUD: Australian Dollar.
2. From Interest Rate Codes, select IRC AUD.
3. From Rate Forecast Method, click Direct Input.
4. Click Define.
5. Type interest rate changes for 02/01/2010 through 04/30/2010.
6. Click Apply.
7. At the bottom of the page, click Save.

NOTE The View button is not available for the parity feature. If you want to view results, enable the "forecast rate" option in the BSP process – Audit Block, for the relevant interest rate codes. Audit results will be written to the FSI_INTEREST_RATES_AUDIT table.

No Arbitrage: Forecast the exchange rates required to maintain equilibrium between the U. S. and Australian dollars. The forecast is based on the historical interest rates from the reference IRC of each currency. This example assumes that the following reference IRCs have been assigned in Rate Management:

- U.S. dollar: Treasury Index
- Australian dollar: IRC AUD

In the Forecast Rates ID window, do the following:

1. From Currency Codes, select AUD: Australian Dollar.
2. From Currency Forecast Method, click No Arbitrage.
3. At the bottom of the page, click Save.

NOTE The View button is not available for the No Arbitrage feature. If you want to view results, enable the "forecast rate" option in the BSP process – Audit Block, for the relevant interest rate codes. Audit results will be written to the FSI_INTEREST_RATES_AUDIT table.

22.3 Economic Indicator Forecast Methods

The following Economic Indicator methods are available:

Figure 137: Economic Indicator Navigation

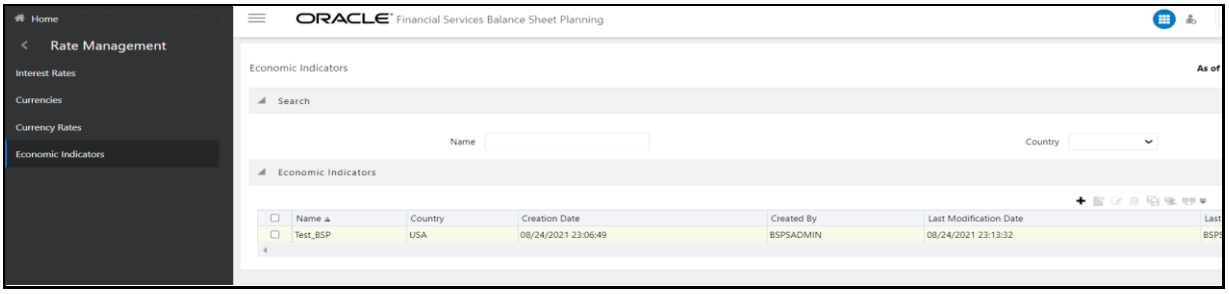
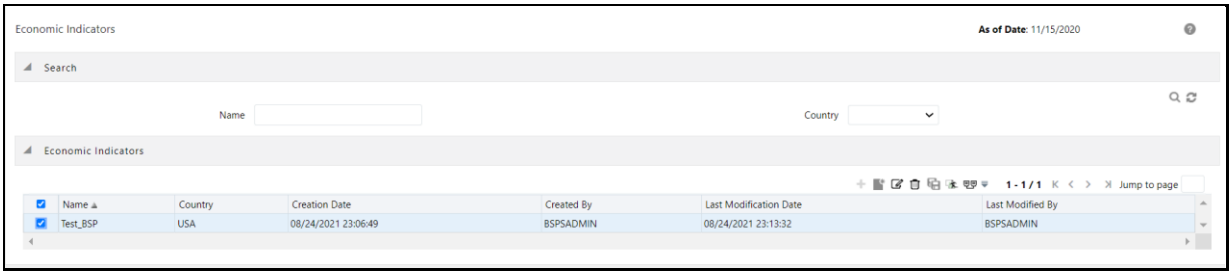


Figure 138: Economic Indicators Summary Page



- **Flat**: Forecast no change in the economic index for all dates beginning with the as-of date.
- **Structured Change**: Forecast the economic index as an incremental change from the previous period.
- **Direct Input**: Type-specific economic index rates to use in forecasting.

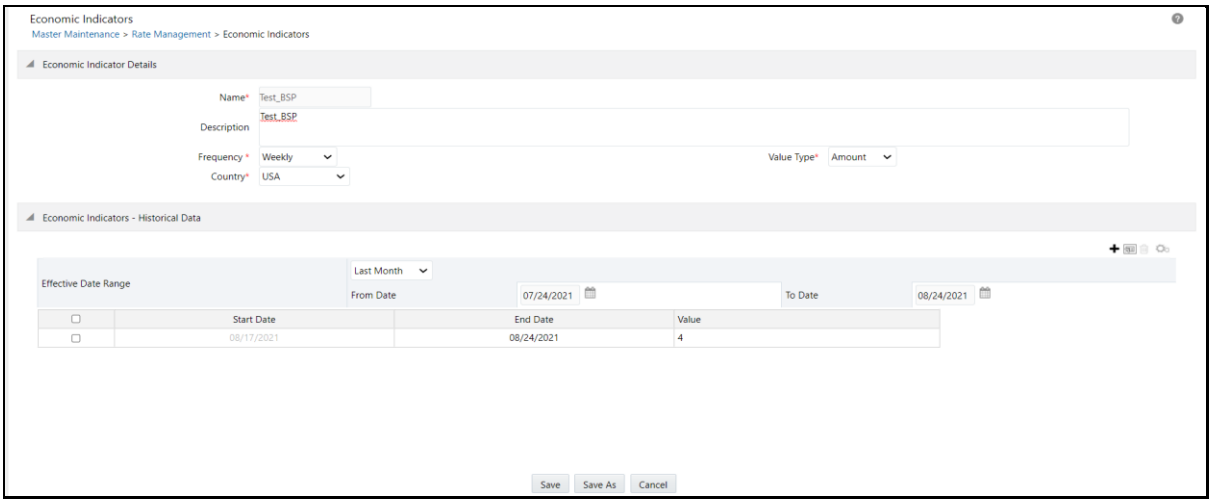
Examples of Economic Index Forecasting

As you follow the steps in the examples, substitute similar data at your site if this particular data is not available.

Flat: View an economic index forecasted for New Residential Sales.

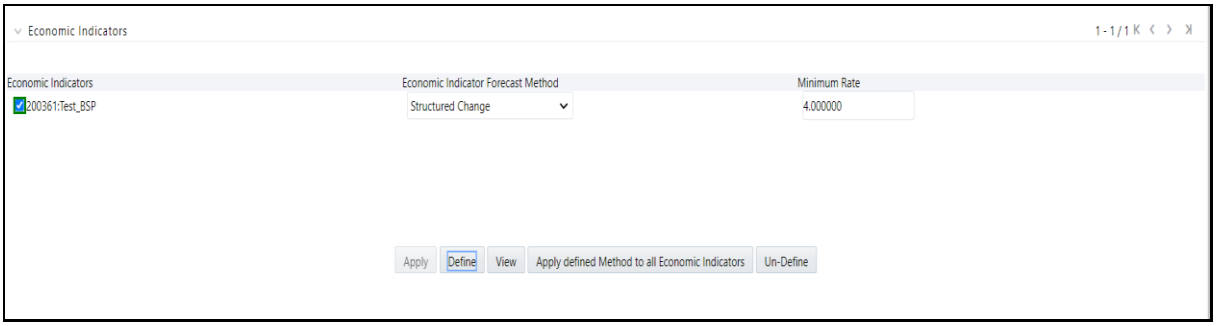
1. From Currency Codes, select USD: US Dollar.
2. From Economic Indicators, select New Residential Sales.

Figure 139: Economic Indicator Details



3. From the Economic Indicator Forecast Method, click Flat.
4. Click View.

Figure 140: Economic Indicators Forecast Details Page



The Economic Indicator View window displays the rates forecasted for the New Residential Sales.

Here, the "Total Rate Change" field will be consistent with the Value field of the Economic Indicator screen.

Structured Change: Model a gradual increase for six months in New Residential Sales.

5. From Currency Codes, select USD: US Dollar.
6. From Economic Indicators, select New Residential Sales.
7. From Rate Forecast Method, click Structured Change.
8. Click Define.
9. Type the Interest Rate Change.
10. Click Apply.
11. Click View.

Figure 141: Economic Indicators Structured Change

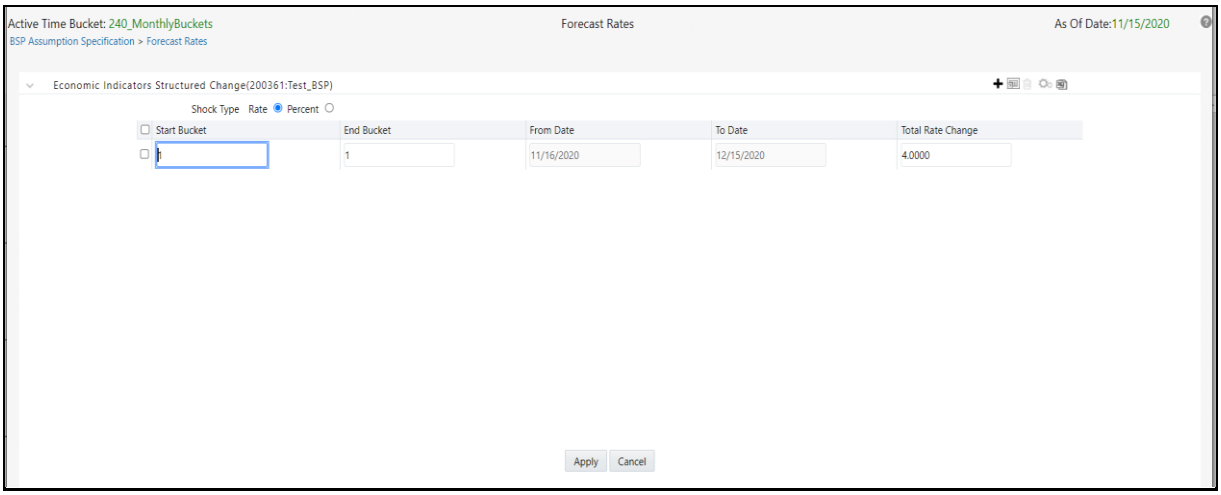
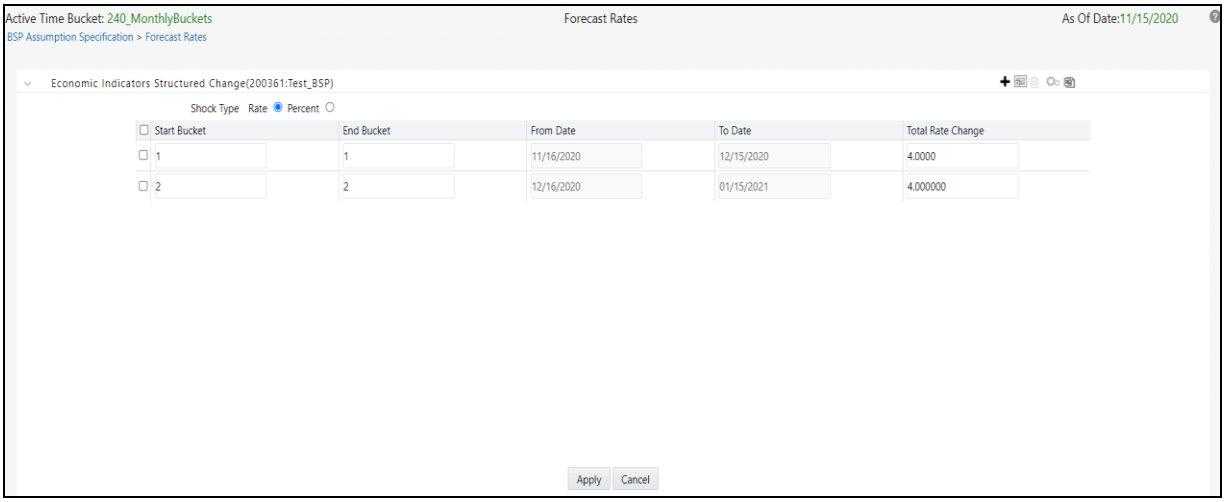


Figure 142: Economic Indicators (Edit)



12. You can see the incremental increase over the six months (150 = 25 per mo * 6 months)

Direct Input: To use the Direct Input method, see Structured Change: with the following modifications:

- In step 3, click Direct Input.
- In step 5, type in New Residential Sales data (forecasted values for each bucket rather than forecasted values changes over a period of one or more buckets).

After you have defined the forecast method for an Economic Indicator, you can undo the definition by selecting the relevant Economic Indicator (green color check-box) and clicking the "Un-Define" button. This will bring the Economic Indicator to its original un-defined state indicated by the red color check box. This step is necessary if you want to delete an Economic Indicator from the "Common Object Maintenance > Rate Management > Economic Indicators" user interface after defining the forecast method for it.

22.4 Interest Rate Forecast Methods

The following Interest Rate Forecast methods are available:

- **Flat**: Forecast no change in the interest rate for all dates beginning with the as-of date.
- **Structured Change**: Forecast rate changes in terms of absolute or percent change, for any modeling period or interest rate term, such as:
  - +100 basis points on Day 1
  - 200 basis points over the first 6 months
  - Yield curve rotation (short point decreasing, long point increasing)
- **Direct Input**: Type interest rates directly, for any modeling period or interest rate term.
- **Implied Forward**: Forecast interest rates based on the yield-curve interest rates in effect at the as-of date and consistent with the modeling bucket definitions.
- **Change from Base**: Make incremental changes to an existing forecast scenario.
- **Yield Curve Twist**: Flatten or steepen the yield curve around a specific point on the curve.
- **Standardized Approach Shocks**: Forecast an interest rate shock according to one of the BSCB Standardized Approach shock specifications (Scenario-level specification).
- **Enhanced Approach Shocks**: Forecast an interest rate shock according to user specifications that will flow into IRRBB Table B reporting.

The following Interpolation Methods are available:

- **Linear Interpolation**: Linear interpolation uses linear yield curve smoothing. Linear yield curves are continuous but not smooth; at each knot point, there is a kink in the yield curve. You may not want to use a linear yield curve with a model that assumes the existence of a continuous forward rate curve, due to the nonlinear and discontinuous knot points of a linear yield curve.
- **Cubic Spline of Yields**: A cubic spline is a series of third-degree polynomials that have the form:

  $y = a + bx + cx2 + dx3$

  These polynomials are used to connect the dots formed by observable data. The polynomials are constrained so they fit together smoothly at each knot point (the observable data point.) This means that the slope and the rate of change in the slope with respect to time to maturity have to be equal for each polynomial at the knot point where they join. If this is not true, there is a kink in the yield curve and they are continuous but not differentiable.

  Two more constraints make the cubic spline curve unique. The first restricts the zero-maturity yield to equal the 1-day interest rate. The second restricts the yield curve at the longest maturity to be either straight (y"=0) or flat (y'=0).
- **Quartic Spline**: Quartic interpolation requires a minimum of 4-knot points. The quartic interpolation equation can be represented as

  $Y = a + b X1 + CX2 + d X3 + e X4$

  The end knot points satisfy equations for one curve and all intermediate points satisfy two curves. Hence in a scenario with a minimum number of knot points, there will be 6 equations. For n number of knot points, the number of equations is 2n-2. If n is the number of points to be

interpolated, the order of the matrix to be formed is 5*(n-1) x 5*(n-1). The matrix is formed according to the following logic:

The second derivative at the endpoints and the first derivative of the last point is Zero. At the points other than the endpoints the value of the first derivatives, second derivatives, and the third derivatives of the function are equal.

NOTE In looking up Forecast Rates, the cash flow engine will (where necessary) perform an interpolation between yield curve term points. For example, in determining a three-month rate from a yield curve that contains only a one-month rate and a six-month rate, the cash flow engine will perform interpolation to determine the implied three-month rate. The interpolation method used is defined by the selected interpolation method for the interest rate curve.

Examples of Interest Rate Forecasting

As you follow the steps in the examples, substitute similar data at your site if this particular data is not available.

NOTE

You can generate the forecast rates for 360 calendar months, Moody's structured cashflow library's structured cashflow library integration is done with BSP. The first month corresponds to the first calendar month of As of Date. The subsequent months are full calendar months. For example, if As of Date is 30 APR 2013, then the first month is April 2013. The second month will be May 2013 and so on. ADCo model requires two IRCs for an ARM instrument (The first is 2 Yr, 10 Yr IRC and the second is the Prepayment Index IRC). For a fixed-rate instrument, 2 Yr, 10 Yr IRC will only be passed.

You can forecast an IRC which has various term points including 2 Year and 10 Year term points. The term points 2 Year (or 24 Months) and 10 Year (or 120 Months) are available. The engine will identify 24 Months term point as 2 Years and 120 Months as 10 Years. If the term point(s) are not available, then the engine will not be able to send the forecast rates for the IRC

The engine will match the last day of the calendar month with the ISB (income simulation bucket) dates and fetch the rate corresponding to the term point to pass to the ADCo model while converting from ISB to 360 months. While converting from ISB to 360 months, if the total ISB size is less than 360 months, then the last available rate needs to be extended till the 360th month. For example, if the ISB covers only 240 months, then the 240th month rate will be applied from 241st to 360th months.

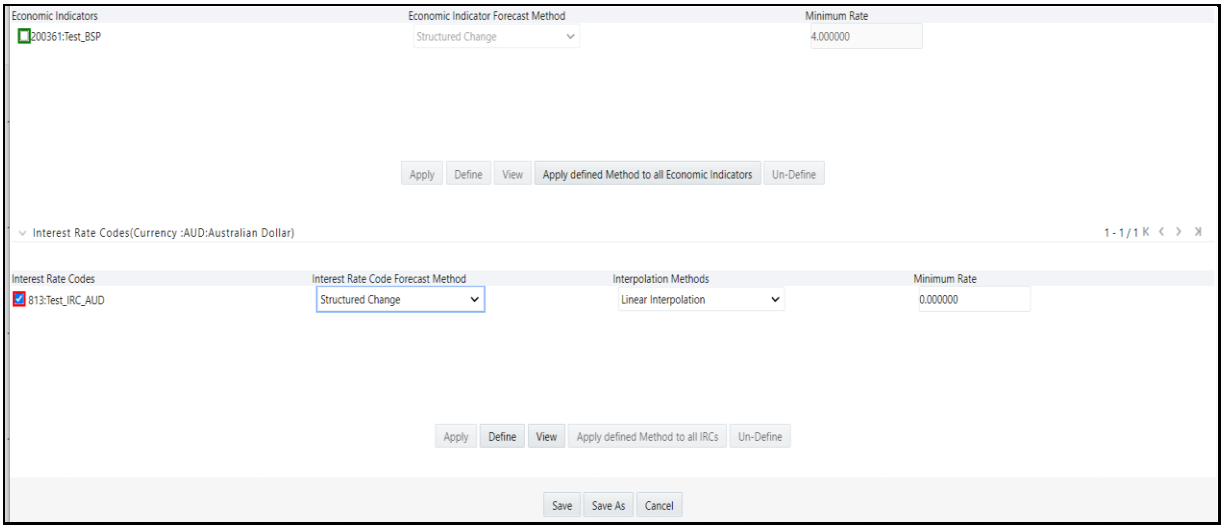
When the "Show 360 months Buckets" check box is enabled, 2 year (24 months) and 10 years (240 months) term points will be highlighted in red color.

The "Show 360 months Buckets" check box is displayed only if the Curve Identifier is defined for base IRC.

Flat: View U. S. dollar interest rates forecasted for the Treasury Index.

1. From Currency Codes, select USD: US Dollar.

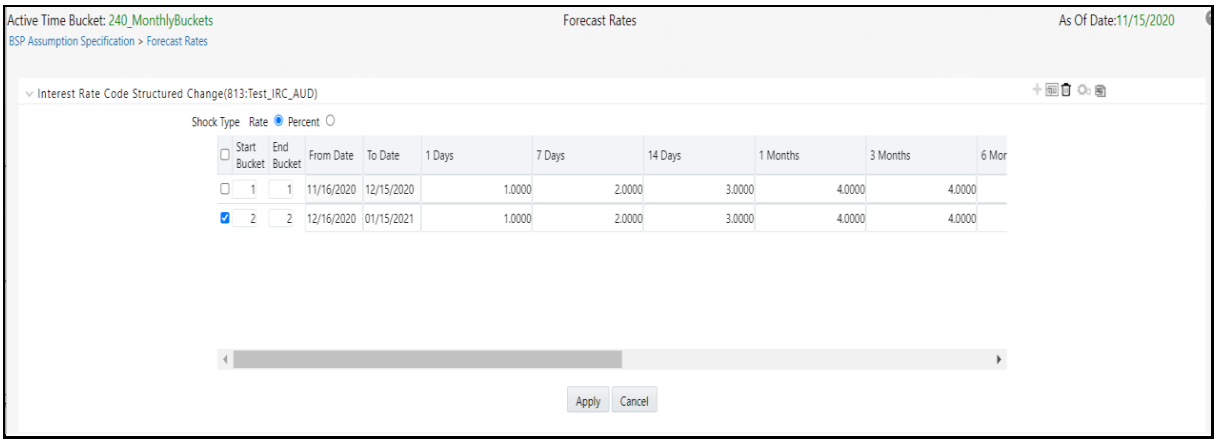
Figure 143: Interest Rate Forecast Method – Currency Selection



2. From Interest Rate Codes, select US Treasury Curve.
3. From Rate Forecast Method, click Flat.
4. Select the Interpolation Method.
5. Click View.

   After clicking View, the Interest Rate View window displays the rates forecasted for the Treasury Index in the ISB view. Here, Show Rates for 360 Months Buckets check box is disabled by default. On checking this box, the results will be displayed for the 360 months view. You cannot enter the values against buckets for the Flat method in 360 months or ISB view. The Show 360 Months Buckets box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to the user.

Figure 144: Economic Indicator Forecast Method – Interest Rate Page

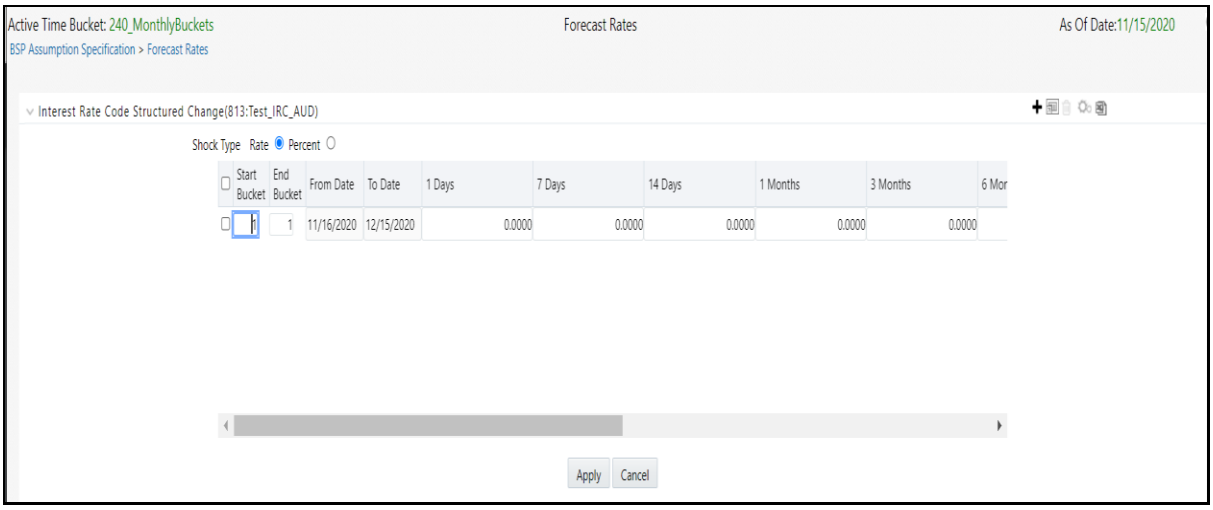


Structured Change: Model a gradual increase for six months in U. S. dollar interest rates.

6. From Currency Codes, select USD: US Dollar.
7. From Interest Rate Codes, select US Treasury Curve.

8. From Rate Forecast Method, click Structured Change.
9. Select the Interpolation Method.
10. Click Define and enter a shock amount to apply to the IRC in absolute or percentage change. You can designate either absolute rate change or percent rate change and click apply.
11. Type the following interest rate changes:

Figure 145: Forecast Rates – Interest Rate Changes

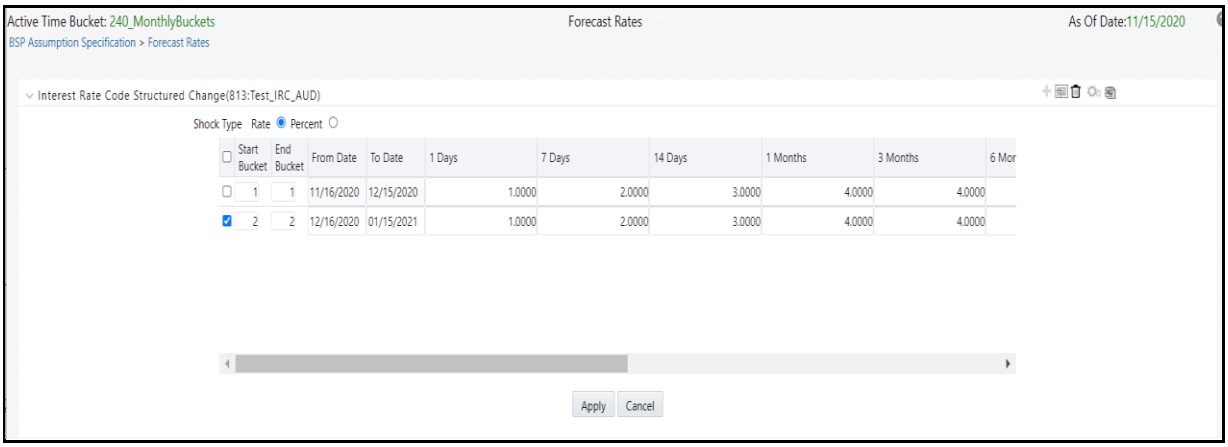


You can also use the Excel import/export feature to add the interest rate changes.

12. Click Apply.
13. Click View.

After clicking View, the Interest Rate View window displays the results in the ISB view. Here, Show Rates for 360 Months Buckets check box is disabled by default. On checking this box, the results will be displayed for the 360 months view. You cannot enter the values against buckets for this method in 360 months or ISB view. The Show 360 Months Buckets box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to the user.

Figure 146: Forecast Rates – Interest Rate Details



14. The rate increases you typed in step 5 are apportioned equally over six months in this case August to January. Therefore, in monthly buckets 2-7, you will expect to see the following increments added to the Treasury Index interest rates:

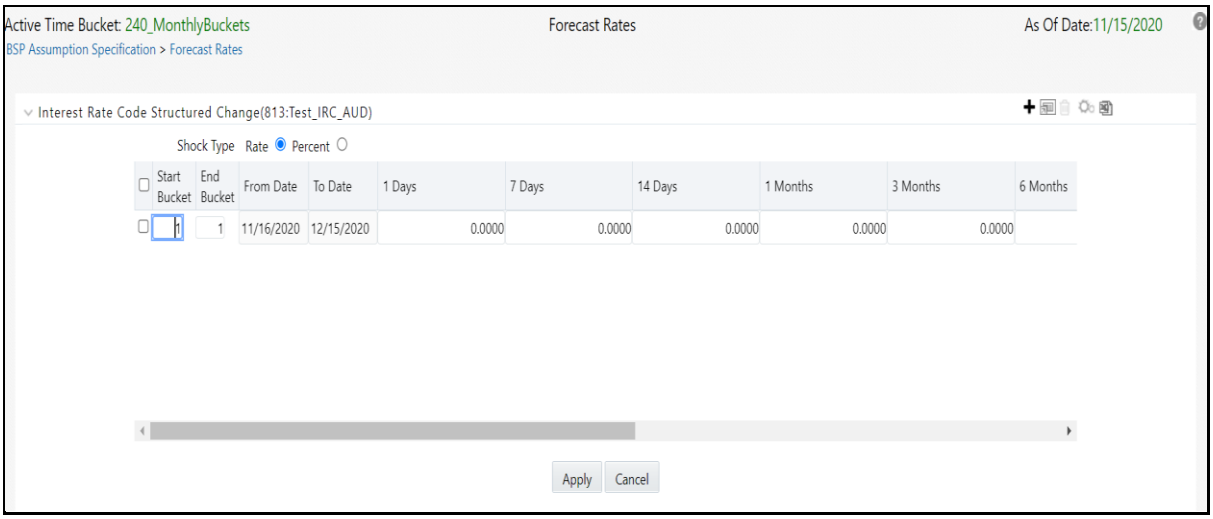
Table 35: Increments added to the Treasury Index Interest Rates

3 month	6 month	1 year	2 year
1/6 of 1.00 = 0.1667	1/6 of 1.25 = 0.2083	1/6 of 1.50 = 0.25	1/6 of 1.75 = 0.2917

15. The interest rates in buckets 2-7 reflect the increases.

    Direct Input: To use the Direct Input method, see Structured Change: with the following modifications:

Figure 147: Forecast Rates – Interest Rate Details

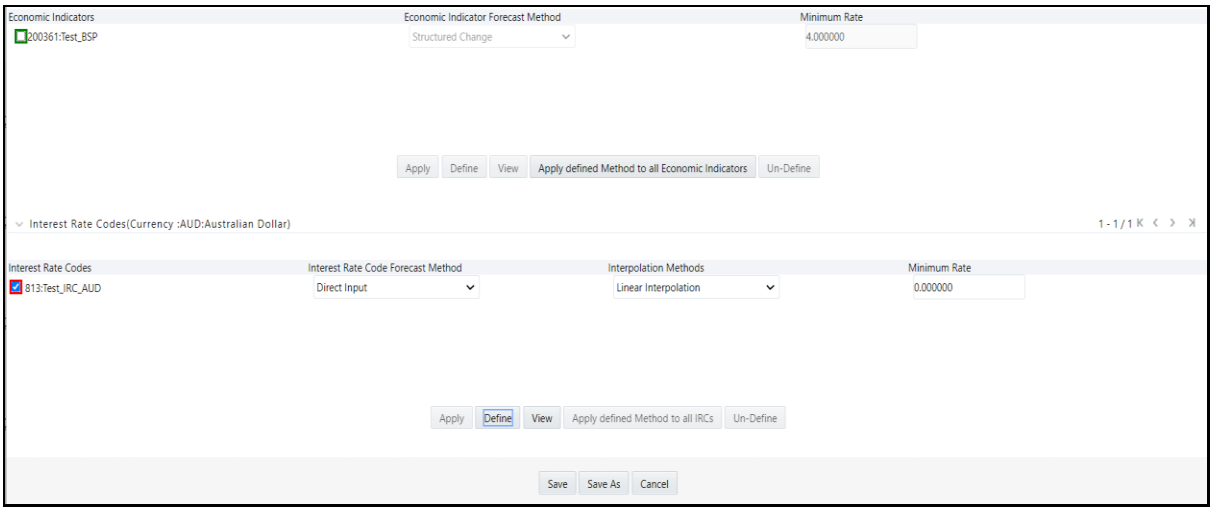


16. In step 5, type interest rates (forecasted rates for each bucket rather than forecasted rate changes over a period of one or more buckets).

17. In step 3, click Direct Input.

    During defining the Direct Input, the “Show 360 Months Buckets” box is checked by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to the user. If you enter the forecast rates against 360 months, the UI converts the same to across income simulation buckets.

Figure 148: Economic Indicator Forecast Method



18. Similarly, users can enter the data for income simulation buckets after unchecking the “Show 360 Months Buckets”. Now, UI will convert the rates from ISB to 360 months view.

    When you switch from ISB to 360 months view or vice versa, you will get a message “Switching the view will erase the existing definition. Do you want to continue?” If you select YES, then the definition is erased. Else, it is retained. In effect, you will be restricted to do the following:

    - Enter the data across ISB, check the “Show 360 Months Buckets” box, and override that data for a few of the 360 months buckets.
    - Enter the data across 360 months buckets, uncheck the “Show 360 Months Buckets” box and override that data for a few of the ISB.

    After defining the rates in 360 Months buckets and clicking View, the Interest Rate View window displays the result in the "360 Months" view. Here, the "Show Rates for 360 Months Buckets" check box is enabled by default.

    If you have defined the rates in ISB and click View, the Interest Rate View window displays the result in ISB view. Here, the "Show Rates for 360 Months Buckets" check box is disabled by default. On checking this box, the results will be displayed for the 360 months view. You cannot enter the values against buckets for this method in 360 months or ISB view.

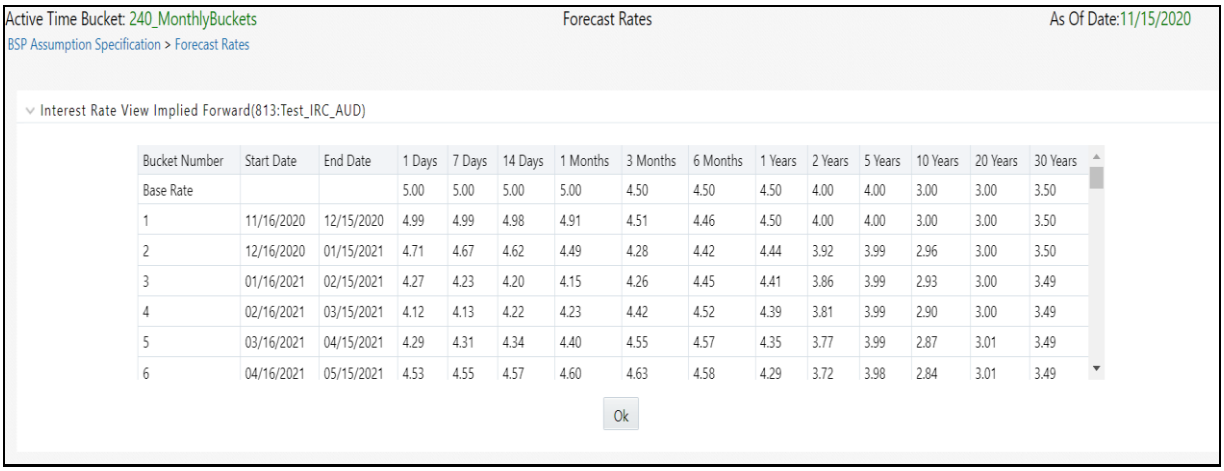
    You can also use the Excel import/export feature to add the interest rates. For more details, see Excel Import/Export.

    Implied Forward: View U. S. dollar interest rates forecasted from the Treasury Index rates and terms in effect at the as-of date and consistent with the modeling buckets.

1. From Currency Codes, select USD: US Dollar.
2. From Interest Rate Codes, select US Treasury Curve.
3. From Rate Forecast Method, click Implied Forward.
4. Click Define and enter a shock amount to apply to the IRC in absolute or percentage change. You can designate either absolute rate change or percent rate change. If no changes are desired to the base curve, leave at 0.0 and click apply.
5. You can also use the Excel import/export feature to add the absolute or percent rate changes.
6. Click view to view the implied forward rates.

After clicking View, the Interest Rate View window displays the results in the ISB view. Here, Show Rates for 360 Months Buckets check box is disabled by default. On checking this box, the results will be displayed for the 360 months view. You cannot enter the values against buckets for this method in 360 months view. The Show 360 Months Buckets box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to the user.

Figure 149: Interest Rate View Implied Forward



Bucket Number	Start Date	End Date	1 Days	7 Days	14 Days	1 Months	3 Months	6 Months	1 Years	2 Years	5 Years	10 Years	20 Years	30 Years
Base Rate			5.00	5.00	5.00	5.00	4.50	4.50	4.50	4.00	4.00	3.00	3.00	3.50
1	11/16/2020	12/15/2020	4.99	4.99	4.98	4.91	4.51	4.46	4.50	4.00	4.00	3.00	3.00	3.50
2	12/16/2020	01/15/2021	4.71	4.67	4.62	4.49	4.28	4.42	4.44	3.92	3.99	2.96	3.00	3.50
3	01/16/2021	02/15/2021	4.27	4.23	4.20	4.15	4.26	4.45	4.41	3.86	3.99	2.93	3.00	3.49
4	02/16/2021	03/15/2021	4.12	4.13	4.22	4.23	4.42	4.52	4.39	3.81	3.99	2.90	3.00	3.49
5	03/16/2021	04/15/2021	4.29	4.31	4.34	4.40	4.55	4.57	4.35	3.77	3.99	2.87	3.01	3.49
6	04/16/2021	05/15/2021	4.53	4.55	4.57	4.60	4.63	4.58	4.29	3.72	3.98	2.84	3.01	3.49

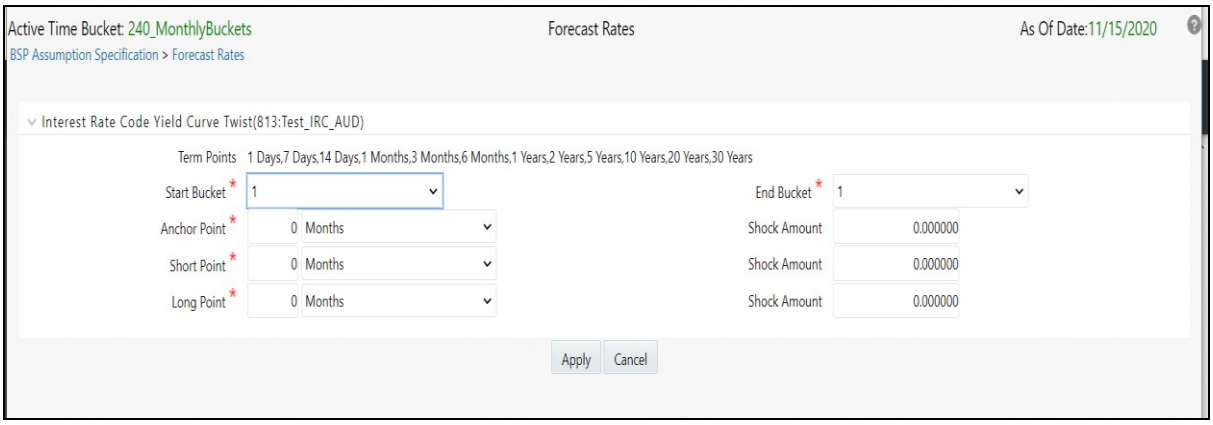
Change from Base: Select a forecast rates scenario that you have already defined and saved and change it by typing incremental changes to rates. For example, you might want to forecast for scenario 1 based on incremental changes to the rates in scenario 2.

After clicking View, the Interest Rate View window displays the results in the ISB view. Here, Show Rates for 360 Months Buckets check box is disabled by default. On checking this box, the results will be displayed for the 360 months view. You cannot enter the values against buckets for this method in 360 months view. The Show 360 Months Buckets box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to the user.

Yield Curve Twist: Set up a scenario to steepen or flatten a given yield curve.

1. From Currency Codes, select USD: US Dollar.
2. From Interest Rate Codes, select US Treasury Curve.
3. From Rate Forecast Method, click Yield Curve Twist.
4. Click Define.
5. Type the following interest rate changes (flattening the curve around the 3-month term point):

Figure 150: Interest Rate Code Yield Curve Twist

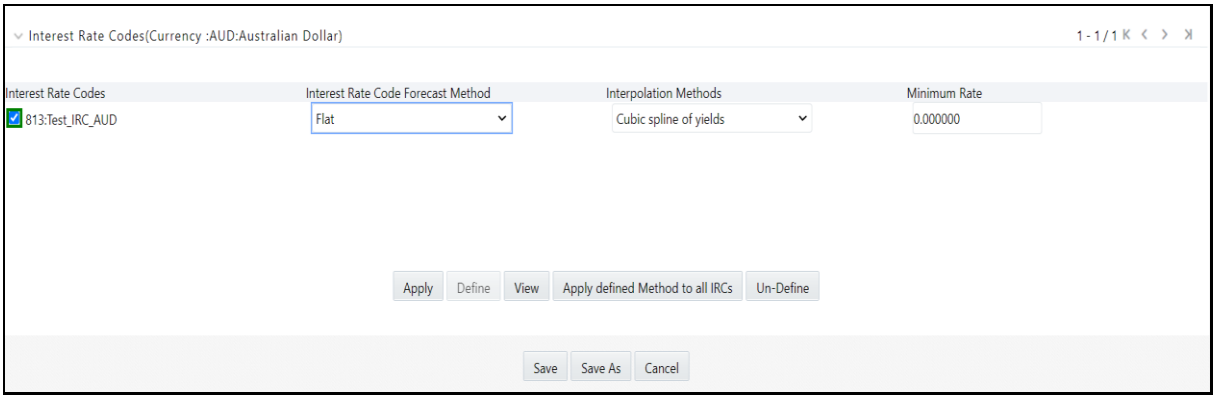


6. Click Apply.

   After clicking View, the Interest Rate View window displays the results in the ISB view. Here, Show Rates for 360 Months Buckets check box is disabled by default. On checking this box, the results will be displayed for the 360 months view. You cannot enter the values against buckets for this method in 360 months view. The Show 360 Months Buckets box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to the user.

After you have defined the forecast method for an Interest Rate Code, you can undo the definition by selecting the relevant Interest Rate Code (green color check-box) and clicking the “Un-Define” button. This will bring the Interest Rate Code to its original un-defined state indicated by the red color check box. This step is necessary if you want to delete an Interest Rate Code from the “Common Object Maintenance > Rate Management > Interest Rates” user interface after defining the forecast method for it.

Figure 151: Interest Rate Codes



Standardized Approach Shocks

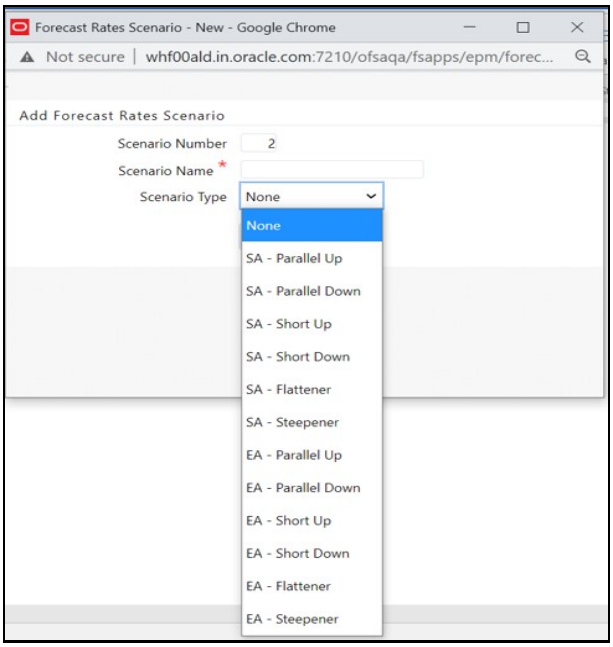
> **NOTE** Standardized Approach shocks are unlike other interest rate rules as they are applied at the scenario level instead of at the IRC level. When a user creates a new Forecast Rates rule, by default, Scenario 1 is always the base scenario for Standardized Approach purposes and cannot have a Standardized Approach shock definition.

1. On the main page of a Forecast Rates rule, select the “IRRBB Shocks”. This will allow users to define either Standardized or Enhanced Approach scenarios, or both for a single Forecast Rates rule. Once a forecast rates rule has been designated as IRRBB Shocks, this check box cannot be unselected unless there are no defined scenarios as either Standardized or Enhanced Approach scenario type.
2. To apply a Standardized Approach scenario, click the “add scenario” button.
3. In the Add Forecast Rates Scenario popup box, select the Scenario Type which you want to apply to this scenario.

> **NOTE** Only one Standardized Approach shock may be applied to a single scenario, and no two SA shocks of the same type may be applied to the same Forecast Rates rule. All qualifying IRCs will inherit this SA shock and may not be changed except for their interpolation method and minimum rate.

4. Click Apply. The scenario is now a Standardized Approach shock.

Figure 152: Add Forecast Rates Scenario



Enhanced Approach Shocks

Like Standardized Approach shocks, Enhanced Approach shocks are scenario-level rules, and Scenario 1 is always referred to as the Base scenario for reporting purposes. However, unlike Standardized Approach shocks, the forecast method for each IRC is not pre-established. This means that users must define the forecast method, interpolation method, and minimum rate for all Interest Rates in each scenario. Once defined and processed, the results will flow through into the Table B reporting.

1. On the main page of a Forecast Rates rule, select the “IRRBB Shocks”. This will allow users to define either Standardized or Enhanced Approach scenarios, or both for a single Forecast Rates rule. Once a forecast rates rule has been designated as IRRBB Shocks, this check box cannot be

unselected unless there are no defined scenarios as either Standardized or Enhanced Approach scenario type.

2. To apply an Enhanced Approach scenario, click the “add scenario” button.

> **NOTE** Only one Enhanced Approach shock may be applied to a single scenario, and no two EA shocks of the same type may be applied to the same Forecast Rates rule. All IRCs in this scenario remain fully editable for Forecast Method, Interpolation Method, and Minimum Rate.

3. Click Apply. The scenario is now an Enhanced Approach shock.

22.5 BSP Volatility Codes

This feature allows users to set a static shock percentage (positive or negative) to be applied to BSP Volatilities in a forecast rates screen.

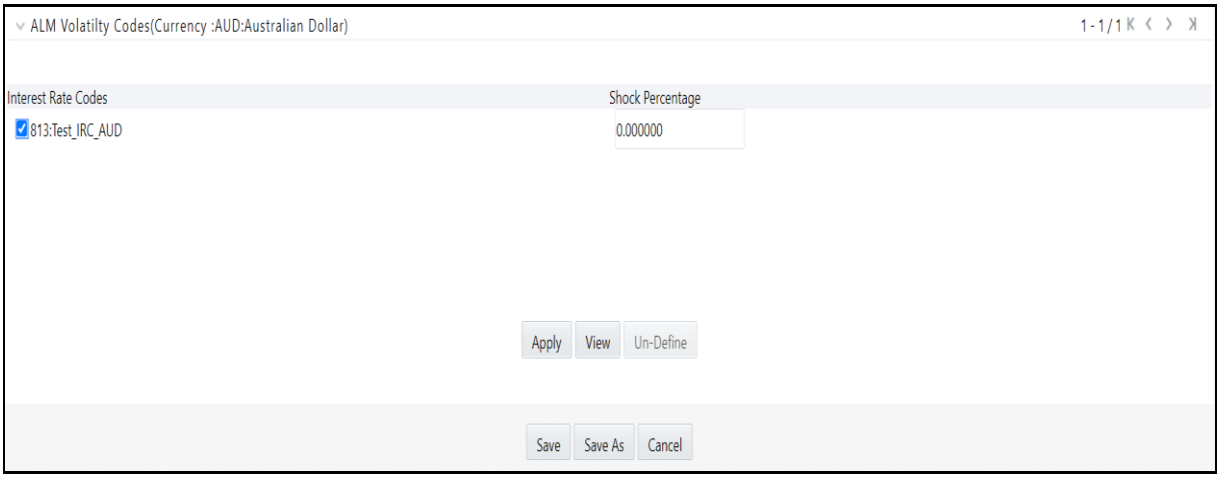
For more information, see the Cash Flow Reference Guide on OHC.

This section will display the list of Interest Rate Codes that are defined as BSP Volatility Surface. For a BSP Volatility to be viewable and editable on this screen, you should have the following prerequisites:

- Be defined in Rate Management: Interest Rate as a BSP Volatility Surface.
- Have a matching currency to the Forecast Rates Reporting Currency.

For more information, see Interest Rates Detail Screen

Figure 153: BSP Volatality Codes



The following is an example to define the Shock Percentage for BSP Volatility Surface: These steps can be repeated for each new scenario.

1. From Currency Codes, select a currency, for example, USD: US Dollar. Only BSP Volatility Surfaces of the same currency will be available.
2. In the BSP Volatility block, select a Vol Surface.
3. Enter shock percentage for respective BSP Volatility. You can enter positive or negative values here (between -99.9999 and 1,000).

4. Click Apply.

   A confirmation box is displayed.

5. To view the results of the shock, select a BSP Volatility then click View.

Figure 154: BSP Volatility Codes

6. To remove the shock percentage, click Un-Define.

22.6 Editing a Forecast Rate

To edit a Forecast rate, follow the steps given below:

1. From Currency Codes, select the Currency Code (for example IND: INDS).
2. Here, initially, the IRC is in Red and after selection (that is, Editing of Currency Code) and clicking on Apply button, it turns to Green color.

> **NOTE** Selecting a different IRC means the addition of an IRC and not the deletion/Unselection of the rest of the IRCs. When you reopen the Forecast Rate, the lowest IRC code will be checked by default.

If the scenario has been defined as a Standardized Approach scenario, this definition may be changed or removed.

3. Select the Edit button for a Standardized Approach scenario
4. To change the scenario from one SA shock to another SA shock, select the new definition. Doing this will change all qualifying SA IRCs to the new definition.
5. To remove a SA definition to the current scenario, select “NONE” as the Scenario Type.

   Note: This will remove all Forecast Method definitions for all qualified SA IRCs.

6. To change the SA definition to an Enhanced Approach definition, select an available Enhanced Approach Scenario Type.

   Note: This will remove all Forecast Method definitions for all qualified SA IRCs.

7. Click Apply to accept the change.

If the scenario has been defined as an Enhanced Approach scenario, this definition may be changed or removed.

8. Select the Edit button for an Enhanced Approach scenario.
9. To change the scenario from one EA shock to another EA shock, select the new definition. Note: Changing from one EA scenario to another EA scenario will not change the IRC Forecast Methods already defined.
10. To remove an EA definition to the current scenario, click to uncheck the selection box “IRRBB Standardized Rate Shocks”. Note: Changing from an EA Scenario type to NONE will not change the currently defined IRC Forecast Methods.
11. To change an existing EA definition to a Standardized Approach scenario, select a currently available Standardized Approach type in the Scenario Type dropdown menu.

    Note: This will change all relevant IRC Forecast Methods definitions.
12. Click Apply to accept the change.

22.7 Behavior Pattern Rule Mapping

The Behavior Pattern Rule Mapping drop-down shows the list of existing Behavior Pattern Rule. you can select any behavior pattern to map with the current forecast scenario. If you want to map a behavior pattern to all the forecast scenarios, the use "Apply to all scenarios" check-box. For more information on Behavior Pattern Rule, see the chapter Behavior Pattern Rule.

22.8 Data Loader Procedure

Stage Forecast Rate Loader procedure loads forecast rate definitions into OFSAA BSP Forecast rates tables from staging tables. Forecast rate parameters for Direct Input and Structured Change methods within a scenario for exchange rates, interest rates, and economic indicators are loaded from staging to the Financial Services Data Model. After loading the forecast rates, the user can view the information in Forecast Rate Assumptions UI.

For information on how to set up the procedure, see Oracle Financial Services Analytical Applications Data Model Utilities User Guide, Stage Forecast Rates Loader.

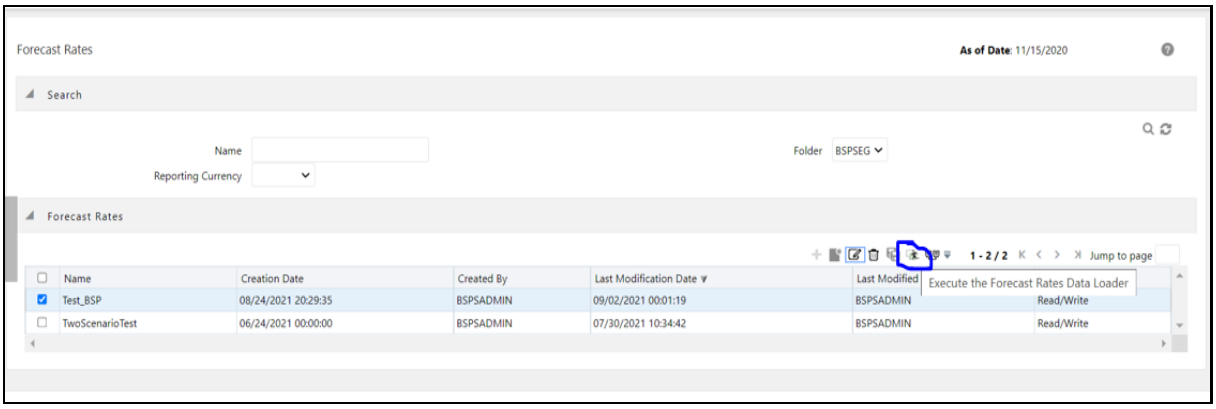
Executing the Data Loader

To execute the Data Loader Procedure:

1. Navigate to the Forecast Rates Main page.
2. Click the Data Loader Execution button on the action bar – This will execute all the available Forecast Rates set up in the data loader for Direct Input and Structured Change methods.

   A warning message will appear: “Update all available Forecast Rates?”
3. Click “Yes”.

Figure 155: Data Loader Procedure


Forecast Rates
As of Date: 11/15/2020
Search
Name
Folder
BSPSEG
Reporting Currency
Forecast Rates
1 - 2 / 2
Jump to page
Execute the Forecast Rates Data Loader
Name
Creation Date
Created By
Last Modification Date
Last Modified
Test_BSP
08/24/2021 20:29:35
BSPSADMIN
09/02/2021 00:01:19
BSPSADMIN
Read/Write
TwoScenarioTest
06/24/2021 00:00:00
BSPSADMIN
07/30/2021 10:34:42
BSPSADMIN
Read/Write

23 Prepayment Rules

Prepayment Rules allow you to specify methodologies to model the loan prepayment, deposit early redemption behavior of products in your portfolio, and quantify the associated prepayment risk in monetary terms. For more information, see Define Prepayment Rules.

The methodologies contained in the Prepayment rule are referenced by both Transfer Pricing and ALM Processes. These prepayment assumptions are used in combination with cash flow based Transfer Pricing methods to generate the Transfer Pricing results.

The procedure for working with and managing the Prepayment Rule is similar to that of other Oracle Funds Transfer Pricing business rules. It includes the following steps:

- Searching for Prepayment Rules
- Creating Prepayment Rules
- Viewing and Editing Prepayment Rules
- Copying Prepayment Rules
- Deleting Prepayment Rules

As part of creating and updating Prepayment rules, you can also define Prepayment Methodologies for all relevant products and currency combinations. See:

- Defining Prepayment Methodologies
- Defining the Constant Prepayment Method
- Defining the Prepayment Model Method
- Defining the PSA Prepayment Method
- Defining the Arctangent Calculation Method

Oracle Funds Transfer Pricing provides you with the option to copy, in total or selectively, the product assumptions contained within the Prepayment, Transfer Pricing, and Adjustment Rules from one currency to another currency or a set of currencies or from one product to another product or a set of products.

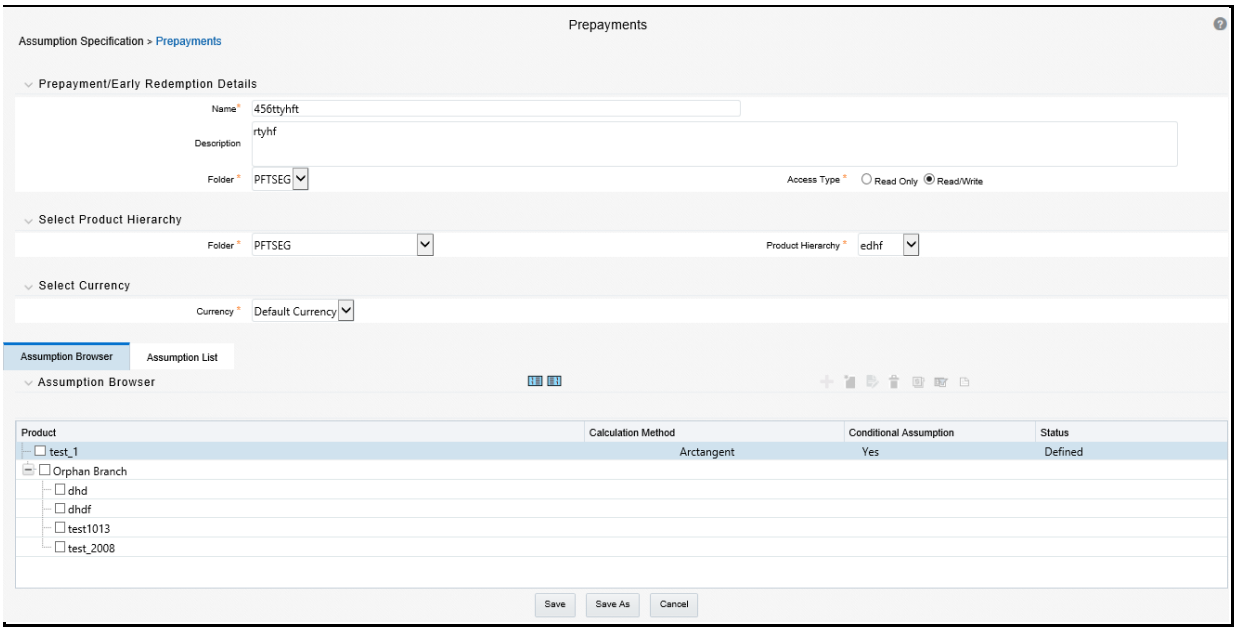
23.1 Creating Prepayment Rules

You create a Prepayment Rule to define prepayment assumptions for new products.

To create a Prepayment Rule, do the following:

1. Navigate to the **Prepayment Rule** Summary Page.
2. Complete standard steps for this procedure.

Figure 156: Prepayments Window



NOTE In addition to the standard steps for creating rules, the procedure for creating a Prepayment Rule involves one extra step. After Standard Step 6, you can select a product hierarchy. You can define methodologies at any level of the hierarchical product dimension. The hierarchical relationship between the nodes allows the inheritance of methodologies from Parent nodes to Child nodes.

23.2 Defining Prepayment Methodologies

The assignment of Prepayment Assumptions is part of the Create or Edit Prepayment Rule Process where assumptions about loan prepayments or deposit early redemptions are made for product-currency combinations. When you click Save in the Create Prepayment Rules process, the rule is saved and the Prepayment Rule Summary Page is displayed. However, Prepayment Assumptions have not yet been defined for any of your products at this point. You would start defining your Prepayment Assumptions for product-currency combinations before clicking **Save**.

The Prepayment Rule supports the definition of Prepayment Assumptions for combinations of two dimensions: Product and Currency.

After you have created a Prepayment Rule, you can assign Prepayment Methodologies to product-currency combinations in either of the following two ways:

- By creating a Conditional Assumption using conditional logic.
- Directly on the Prepayment Methodology Page, as described here.

The prerequisites for defining are performing basic steps for creating or editing a Prepayment Rule.

This table describes the key terms used for this procedure.

Figure 157: Fields in the Prepayments Summary Window and their Descriptions

Term	Description
Calculation Method	The method used to model the prepayment behavior of instruments. Oracle Funds Transfer Pricing provides four prepayment calculation methods: Constant, Prepayment Model, PSA, and Arctangent.
Cash Flow Treatment	The Cash Flow Treatment allows you to specify one of the following two ways in which prepayments are made. • **Refinance**: This is the most commonly used option. Select Refinance to keep payment amounts after prepayment consistent with a portfolio-based assumption. This reduces the scheduled payment amount on each loan and maintains the same maturity term. • **Curtailment**: Select Curtailment to change the periodic payment amounts due. The prepayments are treated as accelerated payments, with a payoff earlier than the originally scheduled term.
Market Rate	The market rate is defined as the sum of the Index (the yield curve rate as described by the Interest Rate Code) and the Spread (the difference between the customer rate and market rate).
Associated Term	The Associated Term allows you to define the term for the point on the yield curve selected in the Market Rate definition that will be used in obtaining the market rate. • **Remaining Term**: The number of months remaining until the instrument matures. • **Reprice Frequency**: The frequency with which the instrument reprices. This defaults to the original term for a fixed-rate instrument. • **Original Term**: The number of months that was the originally scheduled life of the instrument.
Prepayment Rate Definition	This table allows you to specify the constant annual prepayment rate or the associated factors that you want to apply to the instruments having origination dates in a particular date range. The enhancement *Prepayment on custom dates using the remaining balance and de-annualized rate* done by OFS ALM in release 8.0.7.0.0 is not supported by FTP currently.
Seasonality	This table allows you to specify seasonality adjustments. Seasonality refers to changes in prepayments that occur predictably at given times of the year. Seasonality adjustments are based on financial histories and experiences and must be modeled when you expect the number of prepayments made for certain types of instruments to increase or decrease in certain months. The default value for seasonality factors is 1, which indicates that no seasonality adjustment is made for a month. Changing seasonality factors is optional. You can change the seasonality factors for none, one, or multiple months. To make seasonality adjustments, you need to enter a value between 0.00 and 99.9999 for the seasonality factors associated with each month. Seasonality factors less than 1 mean that prepayments are decreased for a particular month. Seasonality factors greater than 1 indicate that prepayments are increased for a particular month.

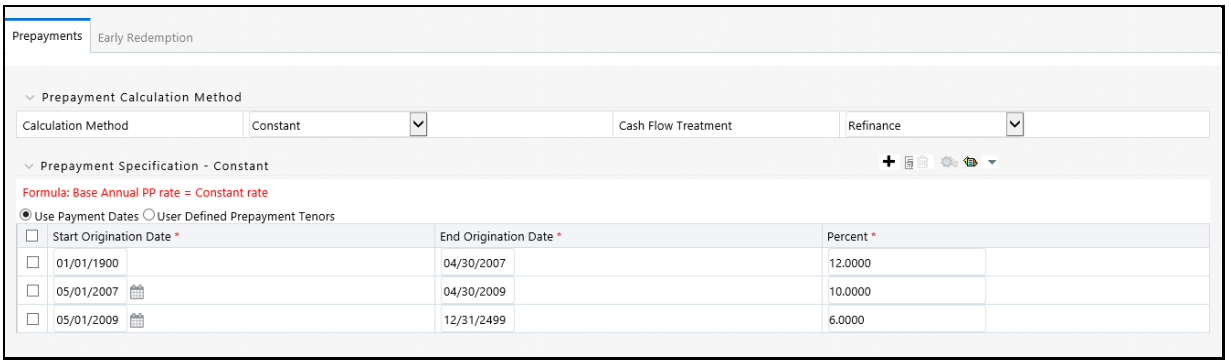
To define the Prepayment Methodologies, do the following:

1. Navigate to the Prepayment Assumption Details Page by selecting a currency and one or more products from the hierarchy.
2. Select a **Calculation Method**, **Constant**, **Prepayment Model**, **PSA**, or **Arctangent**.

> **NOTE** The default value for the Calculation Method drop-down list is Constant. If you select "Do not calculate" as the calculation method, the prepayment assumptions will not be assigned to the particular product-currency combination. This is a particularly useful option when using node-level assumptions because it allows you to exclude a particular Child from inheriting a Parent's assumption.

3. Select a **Cash Flow Treatment** type, **Refinance**, or **Curtailment**.

Figure 158: Prepayment Calculation Method Pane



> **NOTE** Refinance is the most commonly used method.
>
> Define the parameters and annual prepayment rates for the selected calculation method: Constant, Prepayment Model, PSA, or Arctangent.

The parameters displayed on the Prepayment Methodology Page vary depending on the Calculation Method (Constant, Prepayment Model, PSA, or Arctangent) that you have selected. For more information, see the following:

- Defining the Constant Prepayment Method
- Defining the Prepayment Model Method
- Defining the PSA Prepayment Method
- Defining the Arctangent Calculation Method

4. Click **Apply**.

   The Assumption Browser Definition Page is displayed.

At this point, you can continue defining additional methodologies for other product-currency combinations by repeating the above procedure.

5. Complete the process by clicking **Save**.

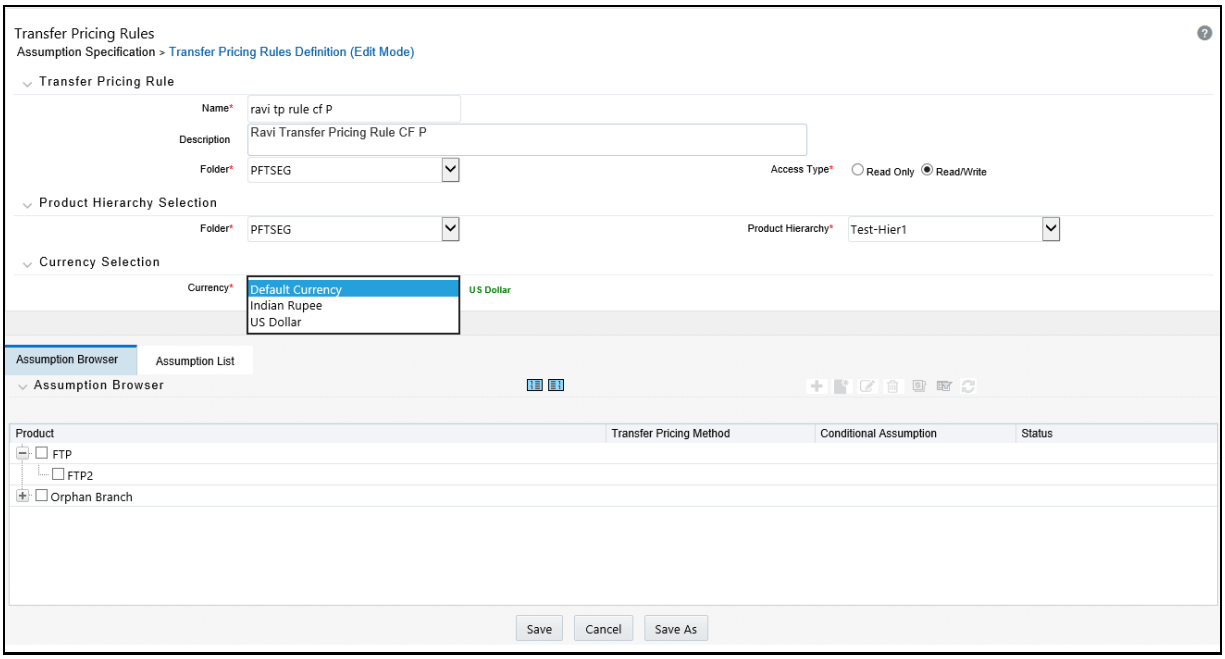
   When you click **Save**, the prepayment assumptions are saved and the Prepayment Rule Summary Page is displayed.

Oracle Funds Transfer Pricing provides you with the option to copy, in total or selectively, the product assumptions contained within the Prepayment, Transfer Pricing, and Adjustment Rules from one currency to another currency or a set of currencies or from one product to another product or set of products.

23.2.1 Defining Assumptions with the Default Currency

For cases where you have the same assumption (method and IRC) which is applicable to all currencies or multiple currencies, you can define rules for the combination of Product and *Default Currency*. To define assumptions for the Default Currency, select a Product from the Hierarchy and *Default Currency* from the currency list and proceed with the assumption definition as described above. When processing data, the TP engine will first look for an assumption that exactly matches the product or currency of the instrument record. If not found, the engine will then look for the combination of the product and the Default Currency. This is a useful option to utilize during setup when the same product exists across multiple currencies and shares the same TP assumption and Interest Rate Code.

Figure 159: Transfer Pricing Rules - Definition Mode



Default Currency setup example: If you have two Instrument Records of the same Product, each with a different currency, for example, 1 is 'USD' and the other is 'AUD', you have two configuration choices. You can either:

- Define the assumptions individually for each product-currency combination using direct input or copy across.

- You can create one assumption for the combination of Product and "Default Currency". When you use "Default Currency", the TP Engine will apply this assumption to ALL currencies (unless a direct assumption is available for the product + currency processed). In the case where users have many individual currencies that utilize the same TP Method and reference IRC rates, this is a useful option because you only have to define the assumption 1 time and it applies to many different Product + Currency combinations.

23.2.2 Defining the Constant Prepayment Method

Use this procedure to define prepayment assumptions using the Constant Prepayment method. The prerequisites for defining the constant prepayment method are performing basic steps for creating or updating a Prepayment Rule.

To define the constant prepayment method, do the following:

1. Select the Start Origination Date using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.

> **NOTE** The first cell in the Start Origination Date column and all of the cells at the End Origination Date column are read-only. This ensures that all possible origination dates have supporting reference values when Prepayment Assumption Lookups occur. Each row in the End Origination Date column is filled in by the system when you click Add Row or save the rule.

   The first Start Origination Date (in row 1) has a default value of January 1, 1900. When you enter a Start Origination Date in the next row, the system inserts a date that is a day before the previous End Origination Date field.

2. Enter the annual prepayment rate percent that you want to apply to the instruments having origination dates in a particular Start Origination-End Origination Date range.

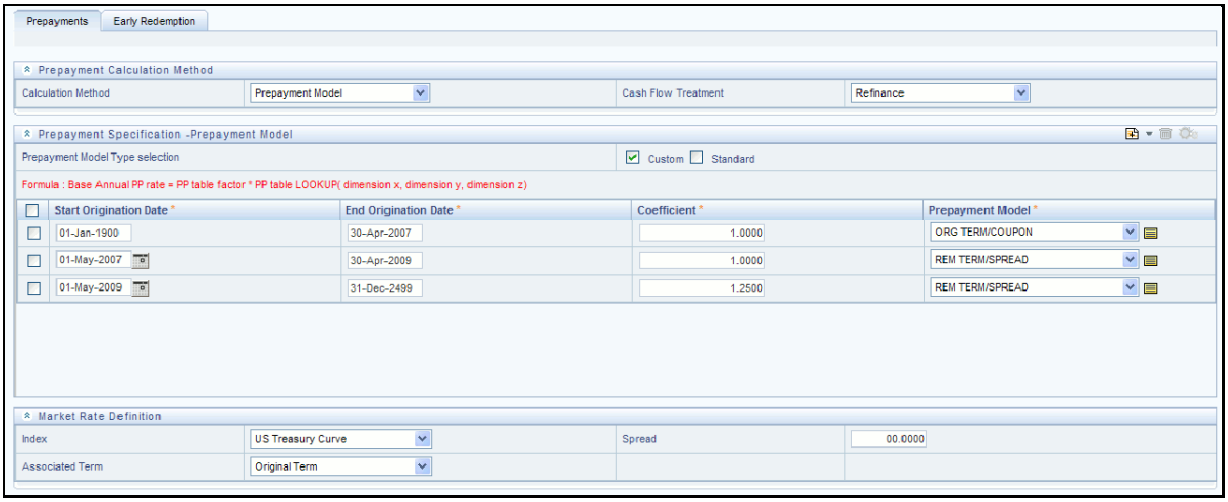
> **NOTE** The Percent column represents the actual annualized prepayment percentage that the system uses to generate the Principal Runoff during the cash flow calculations.

3. Click **Add Row** to add additional rows and click the corresponding **Delete** icon to delete a row. You can add as many rows to this table as you require. However, you need to enter relevant parameters for each new row.
4. Define Seasonality assumptions as required to Model Date-Specific adjustments to the Annual Prepayment Rate. Inputs act as a multiplier, for example, an input of two will double the prepayment rate in the indicated month.

23.2.3 Defining the Prepayment Model Method

Use this procedure to define prepayment assumptions using the Prepayment Model Calculation Method. The prerequisites for defining a Prepayment Model Method are performing basic steps for creating or updating a Prepayment Rule.

Figure 160: Prepayment Calculation Method with Calculation Method as Prepayment Model



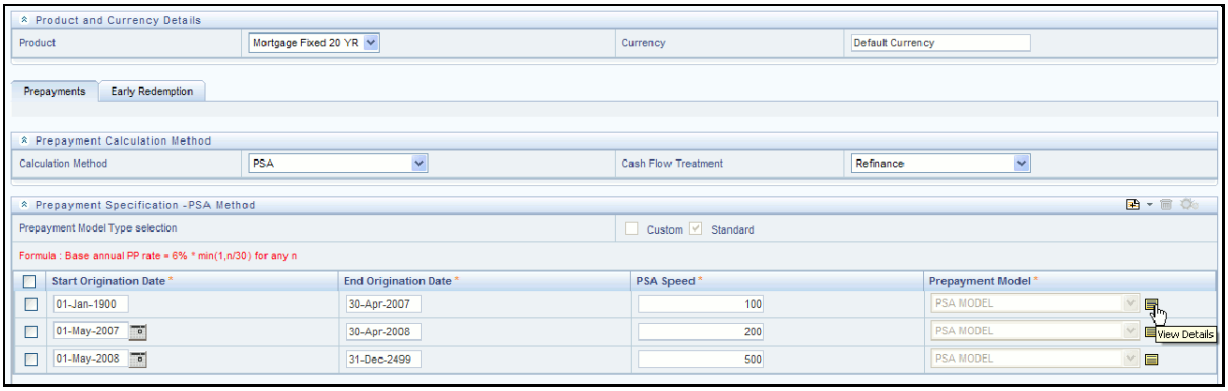
To define the Prepayment Model Method, do the following:

1. Define the source for the Market Rate by selecting an Index (Interest Rate Code) from the list of values.
2. Enter the **Spread**. A Spread is a difference between the Customer Rate and the Market Rate.
3. Select an Associated Term from Remaining Term, Reprice Frequency, or Original Term.
4. Specify the Prepayment Model parameters.
   - Select the **Start Origination Date** using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.
   - Enter the **Coefficient** (if needed) by which the Prepayment Rate should be multiplied. This multiple is applied only to the instruments for which the Origination Date lies in the range defined in the Start Origination Date-End Origination Date fields.
   - Select a predefined Prepayment Model from the Prepayment Model Rule list of values. Click the **View Details** icon to preview the selected Prepayment Model. The system uses the Prepayment Model assumptions to calculate the prepayment amounts for each period. You need to associate a Prepayment Model for every Start Origination-End Origination Date range.
   - Click **Add Another Row** to add additional rows and click the corresponding Delete to delete a row. You can add as many rows in this model as you require. However, you need to enter relevant parameters for each new row.
5. Define Seasonality assumptions as required to model date-specific adjustments to the annual prepayment rate. Inputs act as a multiplier, for example, an input of 2 will double the prepayment rate in the indicated month.

23.2.4 Defining the PSA Prepayment Method

Use this procedure to define prepayment assumptions using the Public Securities Association Standard (PSA) Prepayment Method. The prerequisites for defining the PSA Prepayment Method are performing basic steps for creating or updating a Prepayment Rule.

Figure 161: Prepayment Calculation Method with Calculation Method as PSA



To define the PSA Prepayment Method, do the following:

1. Select the Start Origination Date using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.

> **NOTE** The first cell in the Start Origination Date Column and all of the cells at the End Origination Date column are Read-Only. This ensures that all possible origination dates have supporting reference values when Prepayment Assumption Lookups occur. Each row in the End Origination Date column is filled in by the system when you click **Add Row** or save the rule.

   The first Start Origination Date (in row 1) has a default value of January 1, 1900. When you enter a Start Origination Date in the next row, the system inserts a date that is a day before the previous End Origination Date field.

2. Enter the PSA speed that you want to apply to the instruments having Origination Dates in a particular Start Origination-End Origination Date range. The PSA method is based on a standard PSA curve. You can view the seeded model by selecting the **View Details** icon.

   The default value is 100 PSA and inputs can range from 0 to 1667.

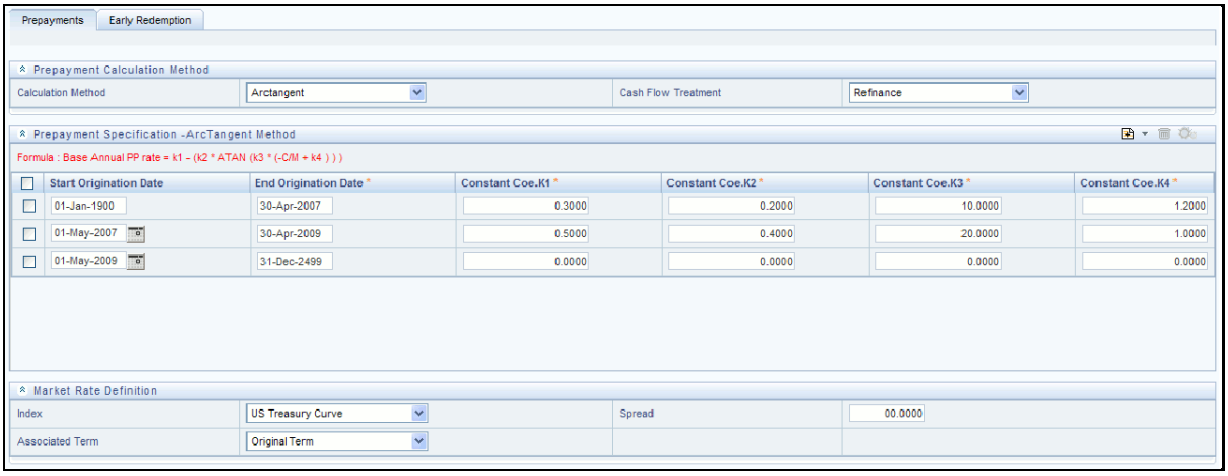
3. Click **Add Row** to add additional rows and click the corresponding Delete icon to delete a row. You can add as many rows to this table as you require. However, you need to enter relevant parameters for each new row.

4. Define Seasonality assumptions as required to model date-specific adjustments to the annual prepayment rate. Inputs act as a multiplier, for example, an input of 2 will double the Prepayment Rate in the indicated month.

23.2.5 Defining the Arctangent Calculation Method

Use this procedure to define prepayment assumptions using the Arctangent Calculation Method. The prerequisites for defining the Arctangent Calculation method are performing basic steps for creating or updating a Prepayment Rule.

Figure 162: Prepayment Calculation Method with Calculation Method as Arctangent



To define the Arctangent Calculation method, do the following:

1. Define the source for the **Market Rate** by Selecting an Index (Interest Rate Code) from the list of values.
2. Enter the **Spread**. A Spread is a difference between the Customer Rate and the Market Rate.
3. Select an **Associated Term** from Original Term, Reprice Frequency, or Remaining Term.
4. Specify the **Arctangent Argument** table parameters.
5. Select the **Start Origination Date** using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.
6. Enter the values for the Arctangent parameters (columns K1 through K4) for each Start Origination Date in the table. The valid range for each parameter is -99.9999 to 99.9999.
7. Click **Add Another Row** to add additional rows and click the corresponding **Delete** to delete a row. You can add as many rows to this table as you require. However, you need to enter relevant parameters for each new row.
8. Define the Seasonality assumptions as required to model date-specific adjustments to the Annual Prepayment Rate. Inputs act as a multiplier, for example, an input of 2 will double the Prepayment Rate in the indicated month.

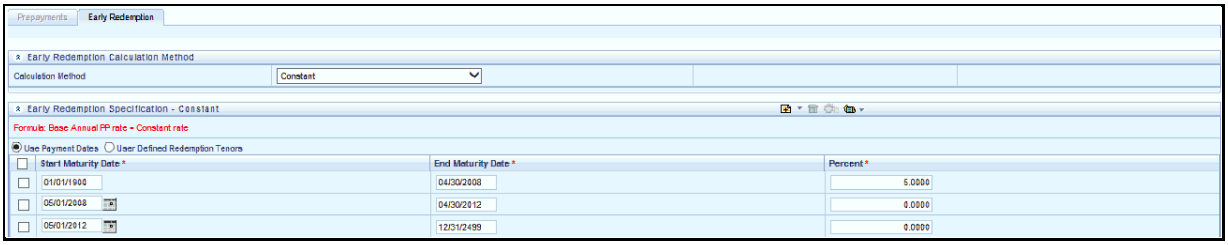
23.2.6 Defining Early Redemption Assumptions

> **NOTE** User-Defined Redemptions Tenors are not applicable for OFS FTP.

If you are working with deposit products, it is possible to define Early Redemption Assumptions within the Prepayment Rule. While defining these assumptions, the Prepayment Rule will consider whether or not the product is an asset or liability (based on the account type attribute defined in dimension member management). If the product is an asset, then the Prepayments tab will be active in the Prepayment Assumption Detail Page. If the product is a liability, then the Early Redemption tab will be active. The prerequisites for defining Early Redemption Assumptions are performing basic steps for creating or updating a Prepayment Rule.

> **NOTE** To define Early Redemption Assumptions, the account type for the selected product must be a liability.

Figure 163: Prepayment Calculation Method with Calculation Method as Constant



To define Early Redemption Assumptions, do the following:

The procedure for defining Early Redemptions is the same as noted above for prepayments, with two exceptions:

- The list of Calculation Methods is limited to Constant and Prepayment Models.
- The range definitions are based on the Maturity Date ranges of the instruments rather than the Origination Date ranges.

Users also have two options for determining the timing of the Early Redemption Assumption. The options include:

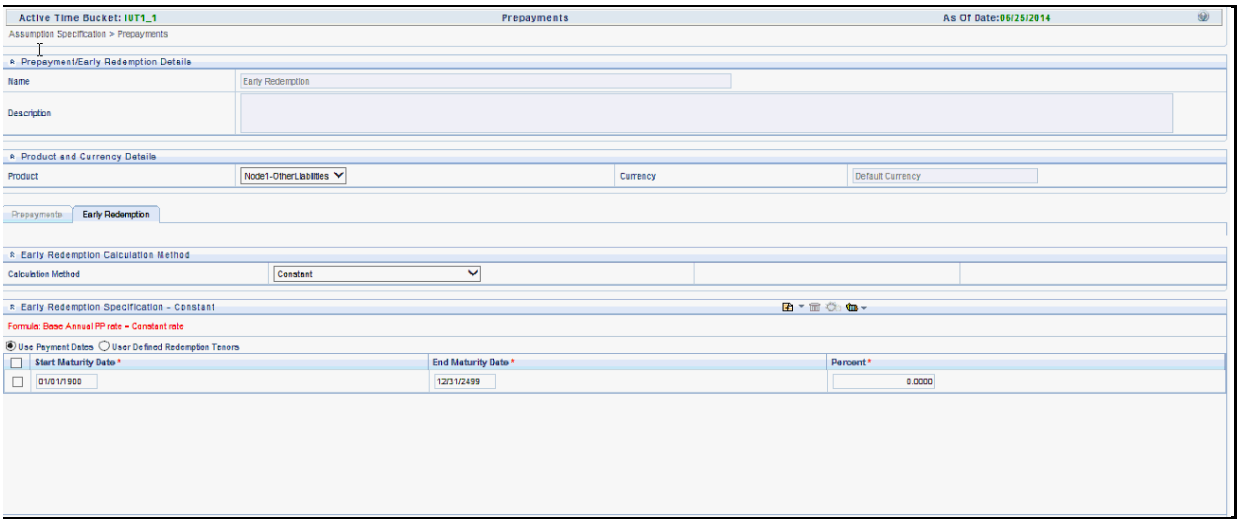
- **Use Payment Dates**: This is the default option. If selected Early Redemption Runoff will occur on Scheduled Payment Dates only.
- **User-Defined Redemption Tenors**: If selected, users can specify any Runoff timing. For example, users might choose to define the early redemption to a Runoff on the first day of the forecast.

To define Early Redemptions within the Prepayment Rule, follow the steps given below:

Use Payment Dates:

Select the “Use Payment Dates” option.

Figure 164: Prepayment - Early Redemption Details



- Enter the Start Maturity and End Maturity Dates.

> **NOTE** The first cell in the Start Maturity Date column and all of the cells in the End Maturity Date column are Read-Only. This ensures that all possible origination dates have supporting reference values when Prepayment Assumption Lookups occur. Each row in the End Origination Date column is filled in by the system when you click Add Row or save the rule. The first Start Origination Date (in row 1) has a default value of January 1, 1900. When you enter a Start Maturity Date in the next row, the system inserts a date that is a day before the previous End Maturity Date field.

- Enter the Annual Prepayment Rate percent that you want to apply to the instruments having Origination Dates in a particular Start Maturity-End Maturity Date Range.

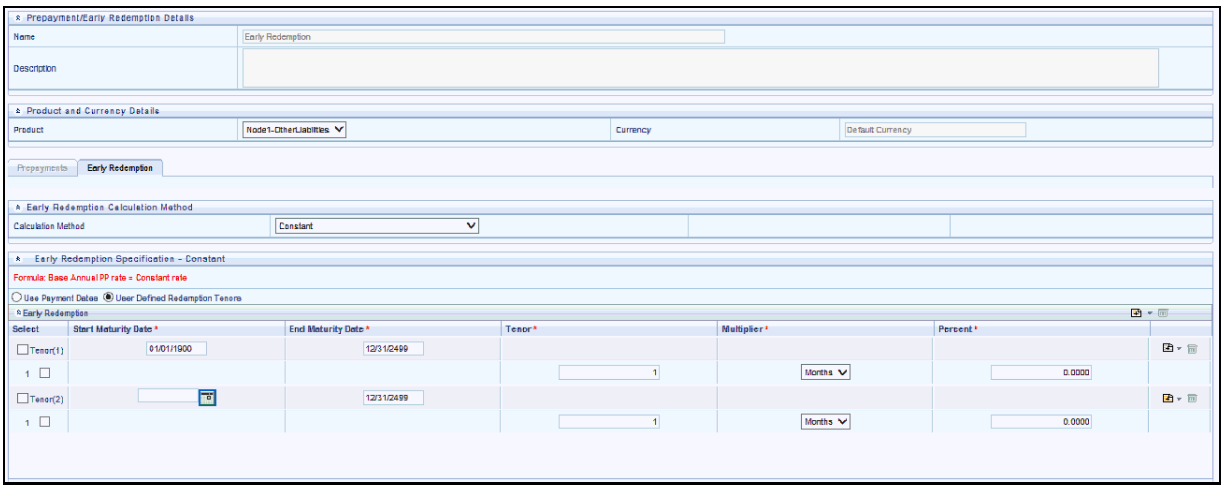
> **NOTE** The Percent column represents the actual Annualized Prepayment Percentage that the system uses to generate the Principal Runoff during the cash flow calculations.

- Click Add Row to add additional rows and click the corresponding Delete icon to delete a row.
- You can add as many rows to this table as you require. However, you need to enter relevant parameters for each new row.
- You can use the Data Input Helper Feature. For more information, see Data Input Helper.
- You can also use the Excel Import/Export Feature to add the Prepayment Rate Information. For more details, see Excel Import/Export.

User-Defined Redemption Tenors:

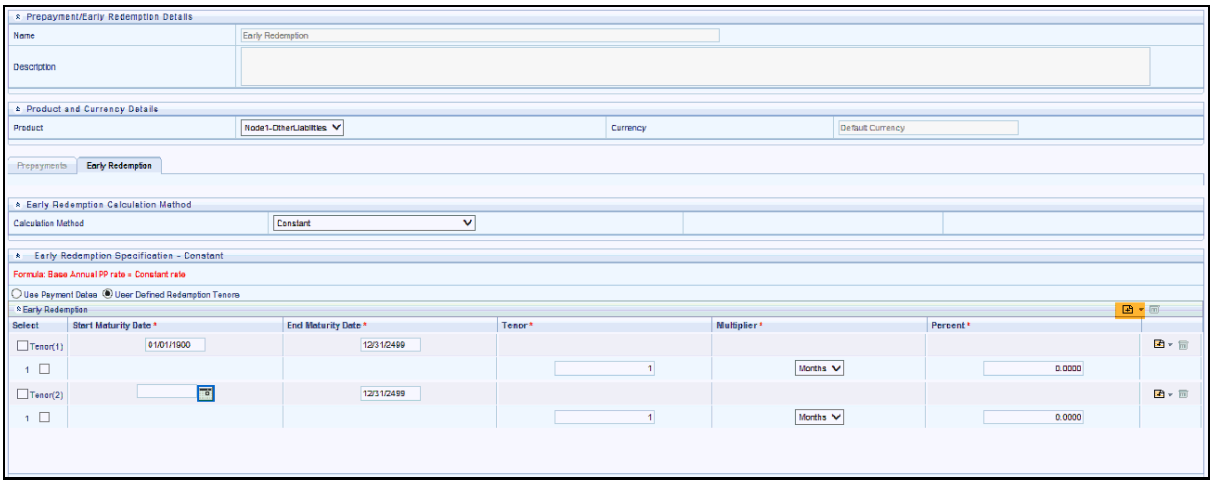
- Select the User Defined Redemption Tenors option. This option allows you to specify the term to Runoff for the particular row. For example, if "1 Day" is defined, then the specified balance (redemption %), will Runoff (mature) on the As-of-Date + 1 Day.

Figure 165: Prepayment and Early Redemption Details



- Enter the **Start Maturity** and **End Maturity** date ranges. Add additional ranges as required using the Add Row button.
- Enter the term to Runoff tenor and multiplier for each of the date ranges.
- Enter the early Redemption Runoff percentage for each of the date ranges.
- Click Add Row to add Additional Runoff % rows and click the corresponding **Delete** icon to delete a row.

Figure 166: Prepayment and Early Redemption Details - Calculation Method as Constant



- Define Seasonality assumptions as required to model date-specific adjustments to the annual prepayment rate or Early Redemption Rate. Inputs act as a multiplier, for example, an input of 2 will double the Runoff rate in the indicated month.

24 Prepayment Models

This module describes the procedure to build Prepayment Models using Prepayment Model Rules. This chapter covers the following topics:

24.1 Overview of Prepayment Models

The Prepayment Model rule allows you to build Custom Prepayment Models. These Prepayment Models can be referenced by a Prepayment Rule to Model Prepayment Behavior of instruments based on a range of instrument level attributes.

The procedure for working with and managing Prepayment Models is similar to that of other Oracle Asset Liability Management business rules. It includes the following steps:

- Searching for Prepayment Models: For more information, see the Search for Rules section.
- Creating Prepayment Models: For more information, see the Create Rules section.
- Viewing and Editing Prepayment Models: For more information, see the View and Edit Rules section.
- Copying Prepayment Models: For more information, see the Copy Rules section.
- Deleting Prepayment Models: For more information, see the Delete Rules section.
- Loading Prepayment Models through a staging table: For more information, see the Prepayment Rate Data Loader section.

24.2 Creating Prepayment Models

Creating a Prepayment Model comprises the following sub procedures:

- Creating Prepayment Models
- Defining the structure of the Prepayment Model
- Assigning Node Values
- Procedure to create a Prepayment Model

This table describes key terms used for this procedure.

Figure 167: Prepayment Model Terms and Descriptions

Term	Description
Dimension	Influences the prepayment behavior of an instrument. You can build a Prepayment Model using up to three prepayment dimensions. Each dimension maps to an attribute of the underlying transaction (For example, age/term or rate and so on) so the cash flow engine can apply a different Prepayment Rate based on the specific characteristics of the record.
Lookup method	Used to calculate Prepayment Rates for the Prepayment Dimension Values that do not fall exactly on the defined Prepayment Dimension nodes. Oracle Asset Liability Management offers the following Lookup methods: • **Interpolation**: Under this method, the prepayment rates are determined by calculating an exact value on an axis. This method assumes that prepayment speeds change on a straight-line basis between the two nodes and calculates accordingly. • **Range**: Under this method, the Prepayment Rates are determined by calculating a range of values on an axis. This method assumes that the Prepayment speed will remain the same for the entire range. The following example explains the differences between these two Lookup methods. The following lists show the age and corresponding prepayment rates of instruments. **Age** • 12 • 24 • 36 • 60 **Prepayment Rates** • 5 • 10 • 15 • 20 Under the Interpolation Method, the Prepayment speeds increase gradually. In this example, the Interpolated Prepayment Rate of an instrument aged 30 months is 12.5%. This is exactly halfway between the 10% and 15% rates. However, under the Range method, the Prepayment speeds increase in steps. Using the Range Method, the Prepayment Rate is 10%, as this rate percentage would apply to the range from 24 months to 35.9999 months.
Nodes	Exact points for each dimension where attribute information has been defined.
Prepayment Rate Calculation	Select the Manual, Integrated Model, or External Models. For more information, see the Prepayment Rate Calculation section.

Select prepayment rate calculation, which could either, be a manual, integrated, or external model.

To create a Prepayment Model, follow these steps:

1. Navigate to the Prepayment Model Summary Page.
2. Complete standard steps for this procedure. For more information, see the Create Rules section.

24.2.1 Procedure to Define the Structure of the Prepayment Model

The Prepayment Model consists of the Prepayment Dimensions and the Bucket Values for these Dimensions, which you select on this page. To define the Prepayment Model Structure, you can select a maximum of three prepayment dimensions. After the dimensions and the number of buckets (tiers) are defined, you need to assign values to the buckets.

24.2.2 Prepayment Rate Calculation

Select Manual, Integrated Model, or External Models. For Manual Mode, you can choose any Prepayment Dimension (max. three), define buckets, bucket values, and finally explicitly populate Prepayment Rate Matrix. For Integrated Model, the Prepayment Dimension, used in a model would be auto-populated as per the selected model. For external mode, you need to define the equation, which would later be used for Prepayment Rate Calculations.

24.2.2.1 Using the Manual Method

Using Manual Method, you can select a maximum of three prepayment dimensions and assign Prepayment Rates manually to the selected dimensions.

> **NOTE** You can use the analogy of a three-dimensional table to understand how to deal with the Prepayment Dimensions. The first dimension you select would resemble the row (X-axis).
>
> The second dimension would act as the column (Y-axis). The final third dimension will be the page (Z-axis).

For selecting the Manual Method, follow these steps:

1. Select the first Dimension.
2. Select a lookup method for that Dimension.
3. Enter the number of Buckets for the Dimension.
4. This number may vary from dimension to dimension.
5. If required, repeat the previous three steps for up to two additional Dimensions.
6. Click **Apply**.

   The Define Dimensions page is refreshed. You can now assign the bucket values for each dimension. At this point, you can also modify the structure of the table, if required.

   The Define Dimensions page is refreshed. You can now assign the bucket values for each dimension. At this point, you can also modify the structure of the table, if required.

   Modifying the Table Structure

   - To add more buckets to a particular Dimension, update the number of buckets for the Dimension and click **Apply**.
   - To delete buckets from a particular Dimension, reduce the number of buckets to the desired value and click **Apply**.

NOTE There are certain restrictions while defining Dimensions:

- You must select the Dimension type for a row and define the values for that dimension.
- You cannot define the second (row) dimension until you have defined the first (row) dimension. Similarly, the third dimension cannot be defined until you have defined the first two dimensions.

7. Assign values for each of the buckets.
8. Click **Apply**.

   The Prepayment Model, Prepayment Dimensions, and Buckets are saved.
9. Enter the Prepayment Rates in the Prepayment Model.

   Bucket values for the row and column dimensions are displayed as a table, while the Bucket values for the page dimensions (if selected) are shown in the drop-down list.
10. Repeat the process for all Bucket Values of the page driver. To change the Bucket Value along with the page driver, select the required value from the drop-down list.

NOTE Bucket values are displayed in the drop-down list only if you selected three drivers.

11. Click **Apply**. The Prepayment Rates are saved and the Prepayment Model Rule Summary Page is displayed.

24.2.3 Using the Integrated Model

In an Integrated Model option, the User has the option to select one of the already saved/confirmed models. For more information on how a model is defined, see the Prepayment Model Analysis section.

To use the Integrated Model, follow these steps:

1. Select Integrated Model Name from the Model Name dropdown list. You can click Model Search to search for an Integrated Model and can filter models based on product and currency.
2. Click **Apply** after selecting the model.
3. Model dimensions would be locked based on the selected model. However, you need to select the Lookup method and buckets for each dimension.
4. Define the bucket values for each model dimension.
5. In this mode, Prepayment Rates are auto-calculated based on the selected model and buckets definition for each dimension. Click **Apply** to populate the Prepayment Rate Matrix. You can edit the values for few cells in the prepayment matrix and **Save**.
6. In case, the model has calculated a negative Prepayment Rate for few cells based on bucket values, you would not be able to save the Prepayment Matrix until all the negative values have

been manually updated. This occurs because only zero or Positive Prepayment Rates are allowed.

7. Use the 'Reset' button if you want to change few values and get the Model Calculated Prepayment Rates back again.

24.2.4 Using the External Model

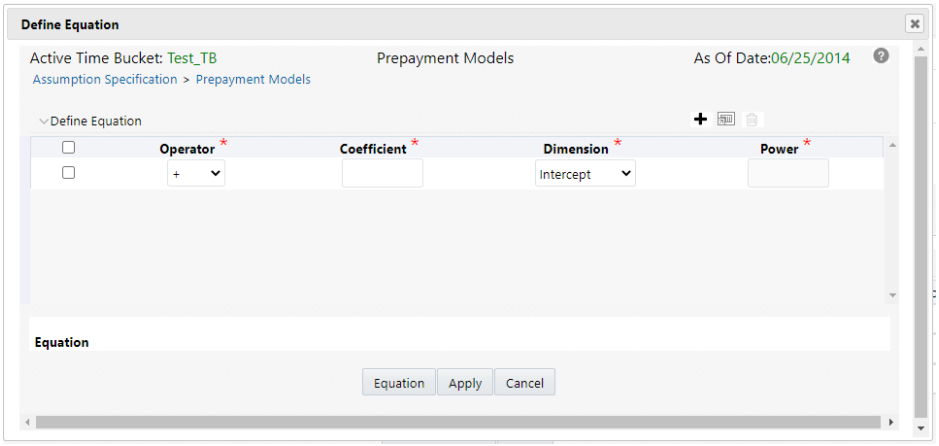
When you select External Model, the Define Equation button is activated to use the External Prepayment Model. This is useful when you want to do Prepayment Modeling outside OFSAA and use the model equation to calculate Prepayment Rates. The following screen is displayed to define the model equation:

Figure 168: External Model

Operator	Coefficient	Dimension	Power
+	2	Intercept	Disabled
+	1.5	Original Term	2
+	3	Rate Diff	2

1. Define the Dimensions and click Define Equation.

Figure 169: Define Equation



2. Define the equation.

   For Example: Equation becomes:

   2 + 1.5 * original Term ^ 2 + 3 * Rate Diff ^ 2

NOTE Before defining an equation, you must select dimensions, and accordingly dimensions dropdown displays values along with the **Intercept**. For example, if you have already chosen Original Term and Rate Difference as dimensions, then the Dimension drop-down list displays the following values:

- Intercept
- Original Term
- Rate Difference

The following mathematical operators are available: +, -, /, and *. After defining all coefficients, Power, operators, click Equation to get the model equation. A confirmation message is displayed. Click **Ok** to use the same for Prepayment Rate calculations.

You can add a new row for each term using A  . Multiple rows can be added using Add Multiple Rows

3. Click **Apply** on the Define Equation window. Click **Cancel** to navigate back to the Prepayment Matrix Screen window.

   After the buckets are defined for the final prepayment matrix, the matrix is auto-populated.
4. Click **Apply** to save the final Prepayment Rates Matrix as per your Defined Buckets.
5. In case, the model has calculated a Negative Prepayment Rate for few cells based on Bucket Values, you would not be able to save the Prepayment Matrix until the user has manually updated all the negative values. This occurs as only zero or positive prepayment rates are allowed.
6. Use the **Reset** button if you want to change few values and get the model calculated Prepayment Rates back again.

24.3 Editing Prepayment Models

As part of editing the Prepayment Models, you can modify the Prepayment Rates and the structure of the Prepayment Model. You can also modify the Lookup Methods (Range or Interpolation), the number of buckets, and the actual values of the buckets. However, if you update the dimensions your previously entered Prepayment Rate Data may be lost.

The prerequisite for editing Prepayment Models is Predefined Prepayment Models.

24.3.1 Procedure

1. Search for the Prepayment Model, which you want to edit.
   For more information, see the Search for Rules section.
2. Select the check box next to the Prepayment Model and select the Edit.

   The Prepayment Model opens in Edit mode.

24.3.1.1 Procedure to Update Rates

Modify the Prepayment Rates in the table as required.
For more information, see Editing Prepayment Rates in a Prepayment Model.

24.3.1.2 Procedure to Update Dimensions Values

To update the Dimensions Values, follow these steps:

1. Click Update Dimensions Values.

   The Update Dimensions page is displayed.

2. Update the structure as required.

   - To add more nodes to a particular Dimension, update the number of nodes for the Dimension and click **Go**.
   - To delete nodes from a particular Dimension, click the delete icon corresponding to the node.

   > **NOTE** Nodes cannot be deleted by reducing their numbers. In addition, all nodes cannot be deleted and at least one node must exist in each Dimension.

   - To change the method of a particular Dimension, select the required method from the corresponding list.
   - To change the value of a node, update the value in the corresponding field.

3. Click **Apply**.

   The Prepayment Model Summary Page is displayed.

24.4 Editing Prepayment Rates in a Prepayment Model

After the basic structure of the Prepayment Model has been created, Prepayment Rates can be added to, or modified for, each of the bucket values along the chosen dimensions.

To add or edit Annual Prepayment Rates in the Prepayment Model, follow these steps:

1. Search for the Prepayment Model, for which you want to define Prepayment Rates. For more information, see the Search for Rules section.
2. Select the check box next to the Prepayment Model and select the Edit icon. The Prepayment rate input page is displayed.
3. Enter the Prepayment Rates in the Prepayment Model for the required dimensions.

   The node values for the row and column dimension are displayed as a table on the Prepayment Rate Input, while the node values for page dimension (if selected) are shown in the drop-down list.

4. Repeat the process for all node values of the page dimension. To change the node value along the page dimension, select the required node value from the drop-down list.

> **NOTE** Node values will be displayed in the drop-down list only if you selected three dimensions. If Prepayment Rates are left blank for any of the dimensions, Prepayment Rates are assumed to be zero.

5. Click **Apply**.

   The table with updated Prepayment Rates is saved.

6. Click **Save**.

   All updates to the Prepayment Model are saved and the Prepayment Model Summary Page is displayed.

24.5 Editing Prepayment Rate Calculation

As part of editing Prepayment Rate Calculation, you can change the Prepayment Rate Calculation and the structure of the Prepayment Model. When you change the Prepayment Rate Calculation, a confirmation message is displayed.

To edit the prepayment rate calculation, select the Prepayment Rate Calculation Model from the Prepayment Rate Calculation drop-down list.

- If you select Prepayment Rate Calculation as Manual, you can edit Dimensions, Bucket Definition, and Market Definition.
- If you select Prepayment Rate Calculation as Integrated, follow the instructions mentioned in Using Integrated Model section.
- If you select Prepayment Rate Calculation as External, follow the instructions mentioned in the Using External Model section.

24.5.1 Excel Import or Export

Excel Import or Export functionality is used for adding or editing Prepayment Rate information. For more details, refer to Excel Import or Export.

24.6 Prepayment Rate Data Loader

The Prepayment Rate Loader procedure populates Prepayment Model Rates in OFSAA metadata tables from staging tables. This loader program can be used to update the Prepayment Model Rates periodically. For more information on setting up the automated process, see the OFS Data Model Utilities User Guide.

To execute the Data Loader Process, click the Data Loader icon on the Prepayment Models rule bar. The process will load all of the data included in the staging tables as defined in the OFS Data Model Utilities User Guide.

24.7 Prepayment Model Analysis

This module describes the procedure for Prepayment Models Analysis.

The Prepayment Model Analysis window allows you to develop a model for prepayment rate calculations as per the chosen risk factors.

You can get the latest status of each step by hovering over progress train blocks, a call out will open with stage milestones which will help to confirm if the process is running or failed.

This section covers the following topics:

- Understanding Prepayment Model Analysis
- Searching for a Model Rule
- Defining a Model
- Editing Prepayment Model Analysis Rule
- Deleting Prepayment Model Analysis Rule
- Copying Prepayment Model Analysis Rule
- Dependency Checking

NOTE Populate the data in table FSI_M_PROD_INST_TABLE_MAP as the model searches the processing tables as per the selected products based on mapping in this table.

Note: Prepayment model analysis is supported only for OEL.

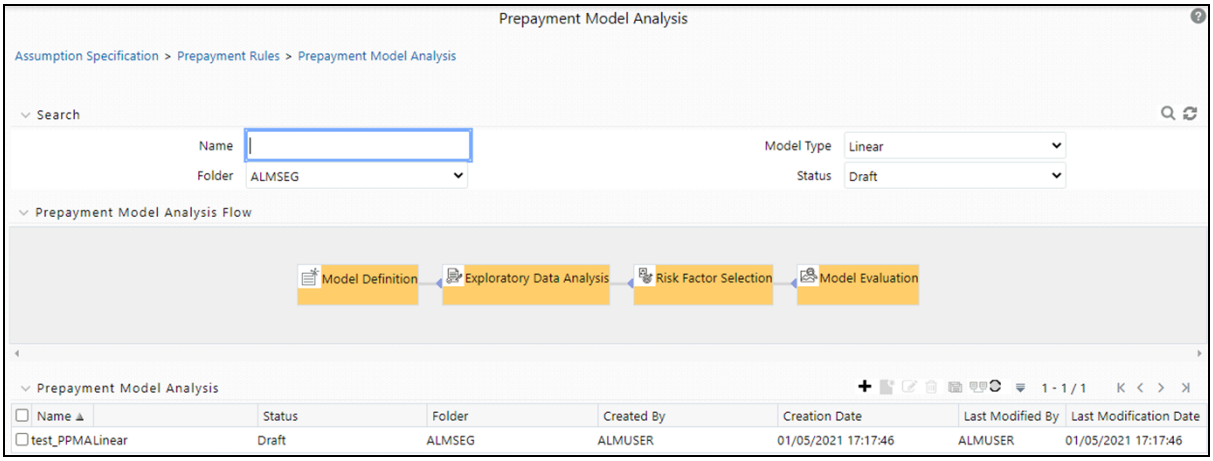
For User Roles and Functions related to Prepayment Model Analysis, see the Creating Application Users section in the OFS Analytical Applications Infrastructure Installation and Configuration Guide.

24.7.1 Understanding Prepayment Model Analysis

In the Oracle Financial Services Analytical Applications Infrastructure Home Screen, select Financial Services Funds Transfer Pricing.

1. To access the Prepayment Model Analysis window, navigate to **FTP Assumption Specification**, select **Prepayment Rules**, and then select **Prepayment Model Analysis**.

Figure 170: Prepayment Model Analysis



2. The definitions based on the search criteria are listed under the List of Prepayment Model Analysis. This is the search section that contains multiple parameters. You can specify one or multiple search criteria in this section. When you click Search, depending upon the search criteria, the corresponding Prepayment Model Analysis Summary would be shown. The Prepayment Model Analysis Summary window displays the following fields.

Figure 171: Fields and Descriptions in the Prepayment Model Analysis Summary window

Fields and Icons	Description
Search	This icon allows you to search the Prepayment Model Analysis definition based on the search criteria specified. Search criteria may include a combination of Name, Folder, Status, and Model Type. The Prepayment Model Analysis rule definitions displayed in the Prepayment Model Analysis Summary table are filtered based on the search criteria specified on clicking this icon.
Reset	This icon allows you to reset the Search section to its default state without any selections. Resetting the Search section displays all the existing Prepayment Model Analysis rule definitions in the Prepayment Model Analysis Summary table.
Name	This field allows you to search the pre-defined Prepayment Model Analysis Rule based on the rule name. Enter the Rule name.
Folder	This field allows you to search for the pre-defined Prepayment Model Analysis Rule definitions based on the selected folder. This field displays a list of folders that you have access to as a drop-down list. Selecting a folder from the drop-down list displays only those Prepayment Model Analysis rule definitions that are defined within the selected folder/segment in the Prepayment Model Analysis rule summary table.

Fields and Icons	Description
Model Type	This field allows you to search the pre-defined Prepayment Model Analysis rule based on type. Model Type would only be defined for "Confirmed" models. All models, which are still in draft, would not have any Model type. This drop-down has the following options: • Linear • Polynomial
Status	This field allows you to search the pre-defined Prepayment Model Analysis rule based on status. This drop-down list displays the statuses Draft or Completed. Selecting a status from the drop-down list displays only those Prepayment Model Analysis rule definitions that are defined within the selected status in the Prepayment Model Analysis Summary table.

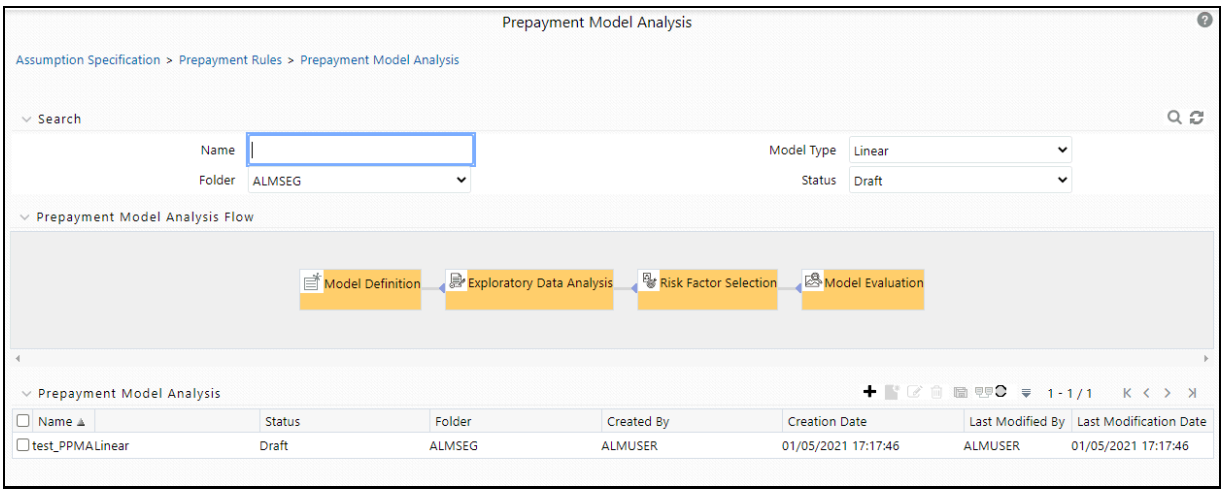
The **Prepayment Model Analysis** Summary page offers several icons that allow you to perform different functions when a Prepayment Model Analysis rule is selected.

Figure 172: Prepayment Model Analysis rule – Icons and Descriptions

Fields	Description
Add	Click **Add** icon to build a new Prepayment Model Analysis rule. The **Add** icon is disabled if any row is selected in the table.
View	Select a single row in the table to enable the **View** icon. Click **View** to view the contents of a Prepayment Model Analysis rule in read-only format. The **View** icon is enabled only when a single Prepayment Model Analysis rule is selected in the table.
Edit	Selecting a single row out of the pane enables the **Edit** icon. Click the **Edit** icon to modify a previously saved Prepayment Model Analysis rule. The **Edit** icon is only enabled when a single Prepayment Model Analysis rule is selected. You can control the number of rows to display on the window by selecting the Pagination Options icon from the action bar.
Copy	Selecting a single row out of the pane enables the **Copy** icon. Click the **Copy** icon to create a copy of an existing Prepayment Model Analysis rule. The **Copy** icon is only enabled when a single Prepayment Model Analysis rule has been selected.
Check Dependencies	Select the Prepayment Model Analysis rule. Click the **Check Dependencies** to generate a report on all rules that utilize your selected Prepayment Model Analysis rule. The **Check Dependencies** icon is only enabled when a single Prepayment Model Analysis Rule has been selected.
Delete	Select one or more rows in the table to enable the **Delete** icon. Click **Delete** to delete the selected Prepayment Model Analysis Rule. Only prepayment models that are not being used, could be deleted.
Refresh	Click **Refresh** to refresh the Prepayment Model Analysis summary page.

To select a Prepayment Model Analysis, select a check box in the first column of the table. More than one Prepayment Model Analysis can be selected at a time, but this disables some of the icons.

Figure 173: Prepayment Model Analysis



You can select or deselect all the Prepayment Model Analysis Rules on the Summary Page by selecting the check box in the upper left-hand corner of the Summary table directly to the left of the Name column header.

The following list provides the Prepayment Model Analysis details based on the search criteria.

- **Name**: Displays the Prepayment Model Analysis Rule's short name.
- **Creation Date**: Displays the Date and Time at which a Prepayment Model Analysis Rule was created.
- **Created By**: Displays the Name of the user who created the Prepayment Model Analysis Rule.
- **Last Modification Date**: Displays the Date and Time when a Prepayment Model Analysis Rule was last modified.
- **Last Modified By**: Displays the Name of the user who last modified the Prepayment Model Analysis Rule.
- **Status**: Displays the Status of the Prepayment Model.

24.7.2 Searching for a Model Rule

Search for a Model to perform any of the following tasks:

- Update, Copy or Delete existing rules.
- Define methodologies for products or define other processing assumptions.

To search for a model, follow these steps:

1. Navigate to the Prepayment Model Analysis Window.
2. Enter the following details:
   - Name
   - Folder
   - Model Type
   - Status

3. Click **Search**.

   Only rules that match the Search Criteria are displayed.

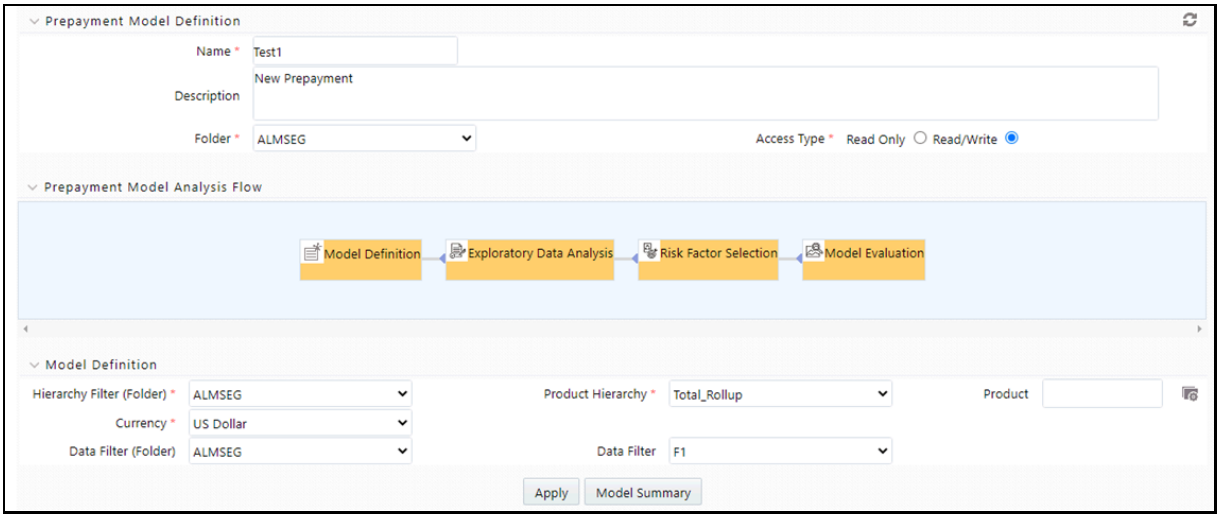
24.7.3 Defining a Model

To define a Model, follow these steps:

1. Navigate to the Prepayment Model Analysis window. Click **Add** +.

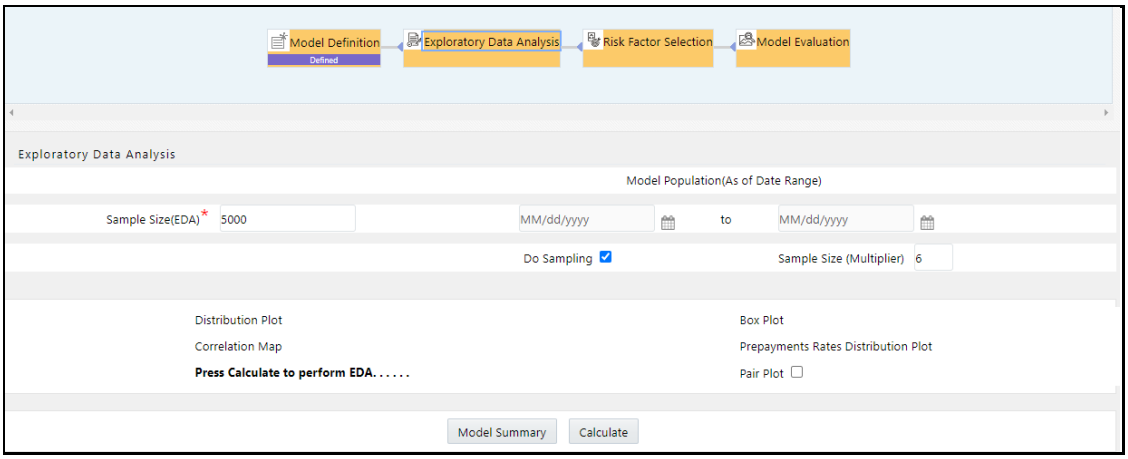
   The Definition window is displayed.

Figure 174: Prepayment Model Definition



2. Enter the following details:
   - **Name**: Enter the name of the Prepayment Model Analysis Rule.
   - **Description**: Enter the description of the Prepayment Model Analysis Rule.
   - **Folder**: Select the folder where you want to save the Prepayment Model Analysis Rule.
   - **Access Type**: Select Access Type as Read-only or Read/Write.
   - **Hierarchy Filter (Folder)**: Select the folder of Hierarchy Filter.
   - **Product Hierarchy**: Select the Product Hierarchy.
   - **Product**: Based on the selected product hierarchy in model definition UI, Hierarchy Browser will expand the product hierarchy and you can select any parent/leaf node by clicking on the view button next to the product in the model definition screen.
   - **Currency**: Select the currency for the Prepayment Model Analysis Rule.
   - **Data Filter (Folder)**: Select the folder name of the data filter for the Prepayment Model Analysis Rule.
   - **Data Filter**: Select the data filter for the Prepayment Model Analysis Rule.
3. Click **Apply** to navigate to the **Exploratory Data Analysis** window.

Figure 175: Exploratory Data Analysis tab



4. Click **Reset** to refresh only the input fields for the model segment.

   The Exploratory Data Analysis window is used to perform EDA calculations.

5. Enter the following details in the Exploratory Data Analysis window.

   - **Sample Size**: The sample size of the dataset for EDA.
   - **Model Population (As-of-Date)**: You can define a date range within which one wants to use data for model creation as model population.

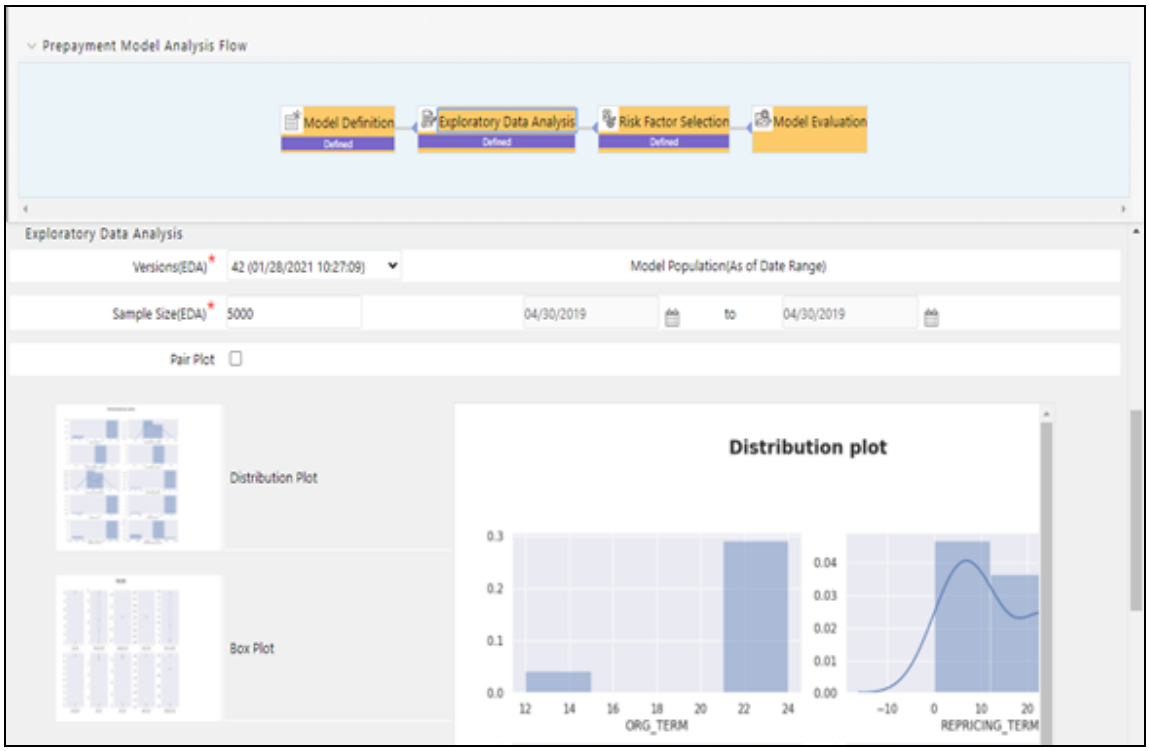
     By default, the Date range would be populated as below:

     - **End Date**: Max (As-of-Date) available in Model input Table.
     - **Start Date**: Max [min (As-of-Date), End Date – 10 Years].
   - **Do Sampling**: Select this option to create a model based on a data Sample rather than the whole population. By default, **Do Sampling** is enabled. This would enhance performance due to the lesser number of records considered for modeling, without degrading model quality.
   - Sample Size (Multiplier): After selecting the sample size for EDA, you can select the multiplier value. This indicates the sample size required for model creation. For example, if 1000, records are selected as the sample size for EDA, and the multiplier is 6, then a minimum of 1000*6 = 6000 records would be required for model creation.

     Note that this check box is enabled only if the Do Sampling check box is selected.

6. Click **Calculate** to perform Exploratory Data Analysis and get EDA plots. You can refresh the window using the **Refresh** button to check if the EDA is completed.

Figure 176: Exploratory Data Analysis



This window gives complete information about all the risk factors along with Prepayment Rates. Therefore, you can decide what all factors would best represent the Prepayment Rate and would be best for model building.

You can hover over any graph and zoom in to enhance the visibility of the graph.

If you are not satisfied with Data and would like to re-define the segment itself, you can click **Model Definition**. Again, the process starts from that step onwards and an updated Segment Definition is saved for the model.

Click **Model Summary** to navigate back to the Model Summary Window after saving all inputs/EDA graphs defined/generated till this point.

Click **Re-Calculate** if you want to change the sample size and redo the EDA again. Change the sample size and click **Re-Calculate**.

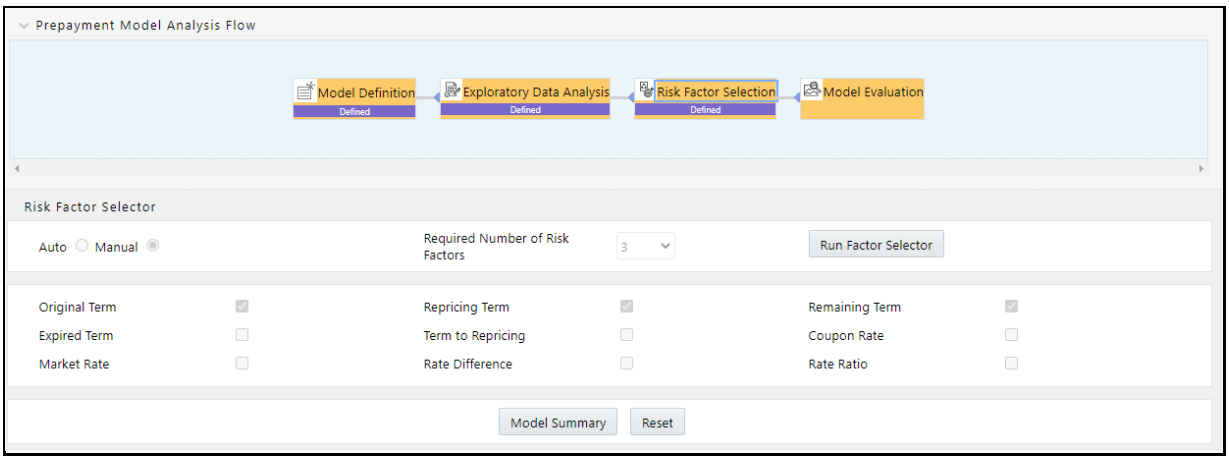
If you want to perform EDA multiple times (for example, three versions V1, V2, V3.), then use Versions (EDA) to view them. For example, when you are on the EDA screen and performing the EDA 3rd time, but still want to go with the second EDA version, then select that version and subsequent processing would be based on V2. If you have Run the EDA only once, then this drop-down is not available.

When you hover over the Sample size for EDA, it displays Default value (callout) as **Default Value is 5000**.

7. Click **Pair Plot** to generate Pair Plot/Grid along with other EDA graphs. Pair Plot/Grid is a detailed graph, that can further slow down the processing. So you can explicitly select the pair plot check box and click on calculate to perform the EDA.
8. Click **Next**.

   The **Risk Factor Selection** window is displayed. By default, all the risk factors will be disabled.

Figure 177: Prepayment Model Analysis – Risk Factor Selection tab



9. Click **Auto Select** or **Manual Select**. By default, the **Auto Select** option is checked.
   - When you are in **Auto Select** Mode, the System would perform required calculations, co-relation/collinearity analysis in the backend based on the required number of risk factors (Maximum three), System would auto-select the best representative set of risk factors as per the input data.
   - If you want to re-define the segment itself again, click the Model Definition block and change the segment. Again, the process starts from that step onwards and an updated segment definition is saved for the model. If you want to change sample size and re-calculate EDA again, click Exploratory Data Analysis block and perform EDA with updated sample size. Again, the process starts from that step onwards, and updated EDA plots/graphs would be saved for the model.
   - When you select **Manual Select** Mode, all risk factors are available for selection. Select 1, 2, or 3 risk factors based on your data.
10. Click **Next** to navigate to the **Model Evaluation** Window.

    A confirmation message is displayed. Click **OK**.

Figure 178: Prepayment Model Analysis Flow

11. Click **Calculate** to view all the evaluation parameters and quality plots.

    Click Re-Calculate if you are not satisfied with the model quality to change the model parameters and revise the Model Definition. You can zoom the graph to enhance visibility.

    You can select any risk factor as page axis for sample prepay matrix on Model Evaluation window; using re-define sample button, only when the number of risk factors is 3. The same selected page axis will be carried forward while creating a prepayment matrix as well.

    If you are changing parameters and generating different versions of the model, then you can see all the versions, generated due to a different set of model parameters in the Versions (Model) drop-down. If you have run “model evaluation’ only once, then this drop-down and title above “Model Versions” are not available. As per the selected version, the **Advanced Model**

Details window is also updated. The **Model Details** window helps you to evaluate the model fit. It has the following comparisons:

Predicted Values Vs Risk Factor 1, 2, 3, as per the number of risk factors considered for Model Building. This should dynamically adjust as per the number of risk factors selected.

Predicted Values versus Test Sample.

Sample Prepayment Matrix as per both the models (Linear and Polynomial). For this, all the risk factors are stored with values for 7 buckets, so it would be a 7*7 matrix.

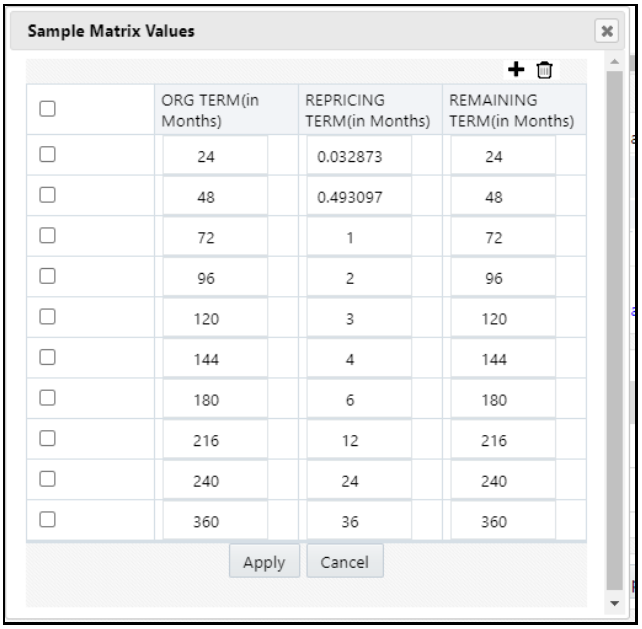
Figure 179: Sample Prepayment Matrix – Linear and Polynomial Models

Click **Model Summary** to view the Model Summary Window, after saving all the details.

Click **Re-Define Sample** if you want to modify risk factor values for the Sample Matrix. This pop-up would dynamically adjust to display 1, 2, or 3 dimensions as per the chosen model.

If you want to update values on which sample matrix is generated, you can click on 'Re-define Sample'. The following window would open up where you can update the risk factor values:

Figure 180: Sample Matrix Values



Add row using **Add** +. You can add multiple rows or delete multiple rows using buttons in panel 1. The default sample matrix is10*10, but after you re-define the sample, the matrix can be truncated to any dimensions.

The redefined matrix will be saved along with the model.

Model summary parameters like R2, AIC, and BIC.

Both (Linear/Polynomial) models are produced when the system compares model generated R2 against the R2 threshold defined by the user. The final option is given to you to choose any one of these models. Based on infrastructure availability and model complexity, users can choose any one of the linear/polynomial models.

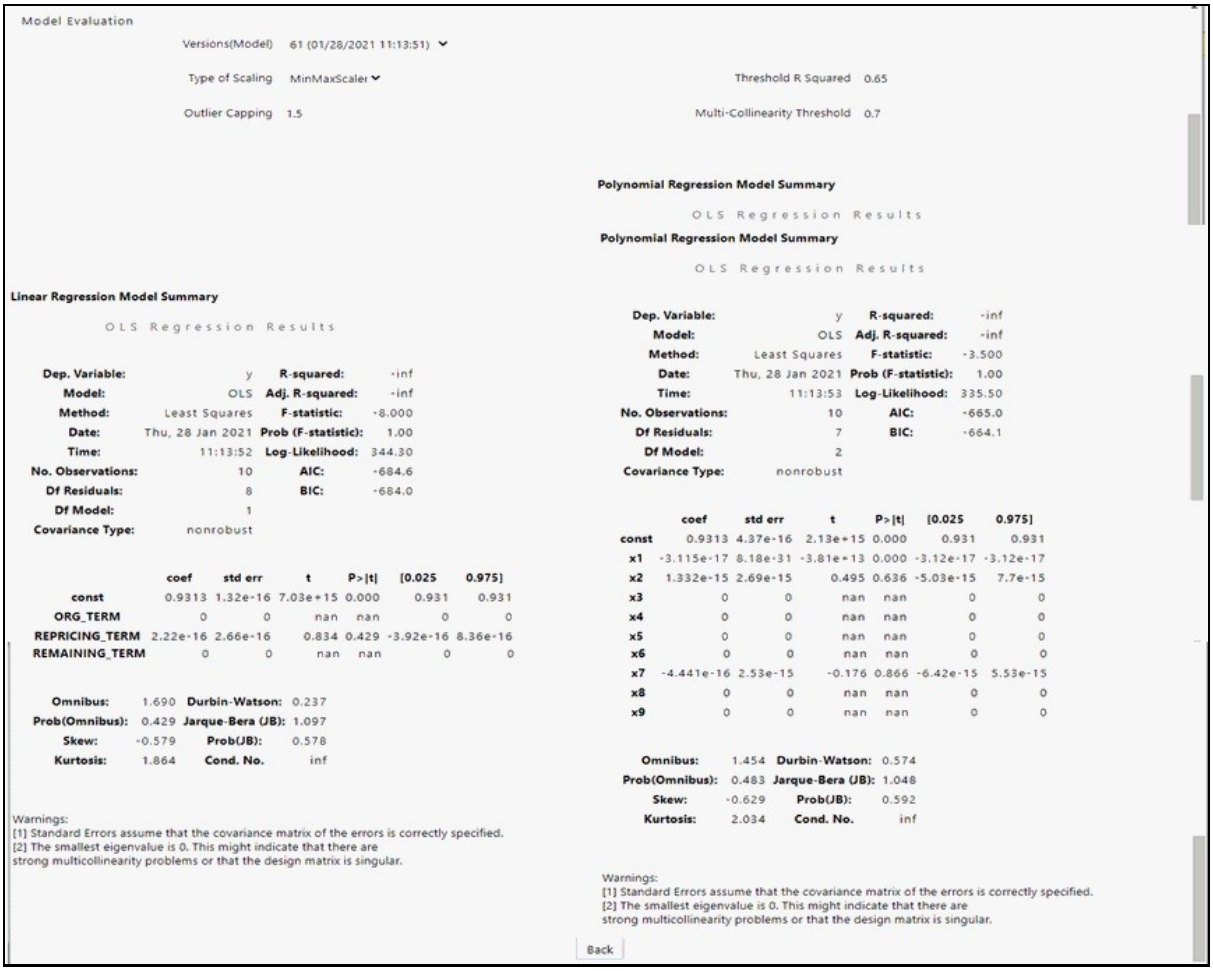
Click **Save Model** to save the model. The same model can be referred to populate prepayment rate matrix. Click **Re-Calculate** to re-evaluate the model based on changed model parameters.

If you want to change sample size and re-calculate EDA again, click Exploratory Data Analysis block and perform EDA with updated sample size. The process starts from that step onwards, and updated EDA plots/graphs are saved for the model.

If you want to update selected risk factors, click the Risk Factor Selection block and change risk factors. The process starts from that step onwards and updated risk factors are saved for the model.

Advance Details: To verify the model quality, the model statistics are given on a different screen, which would be available with the 'Advance Details' button like R2, F value, P-Value, and so on.

Figure 181: Advance Details



The **Reset** button on each screen would help to delete all the calculations done in subsequent steps. For example, if you have done EDA and selected a particular EDA version to do further calculations like 'Risk factor Selection' or 'Model Evaluation'. If you are not satisfied with the model, you can go

back to EDA, click **Reset** to clear out the details/calculations performed in subsequent stages and recalculate with a different set of parameters.

The following are the default values/usage of Parameters:

Figure 182: Default Values/Usage of Parameters

Parameter	Description
EDA Sample Size	This allows you to define a sample size for exploratory data analysis. A bigger sample would increase CPU and memory usage, but it would better represent the model population. You have the option not to use sampling by setting the Do_Sampling parameter to false. The procedure for the same is given in the following section.
Type of scaling	On many occasions, risk factors are not in a consistent range, for example. one of the risk factor's values could be in the 1-500 range but another risk factor could be just in the 2-3 range. Therefore, risk factor 1 would influence the model and you would get a biased model. To make all the risk factors consistent, scaling is used. There are two types of scaling: • Min-Max Scaling = (X – min)/(max – min) • Standard = (X – Mean)/Std. Deviation
Threshold R2	R-squared values range from 0 to 1 and are commonly stated as percentages from 0% to 100%. An R-squared of 100% means that all movements of prepayment rate (dependent variable) are completely explained by movements in the chosen risk factors (independent variable(s).
Multi-collinearity Threshold	For model creation, if two risk factors/variables are highly correlated or correlation > 0.7, they make the model unstable. Therefore, based on this value, if variables are highly correlated or above-defined threshold, one of them would be dropped while modeling creation.
Outlier Capping	This allows you to reject values beyond a certain percentile. Sometimes, input data has few extreme values which could distort the model. Therefore, you can reject those values and get a stable model.

Default values for Exploratory Data Analysis:

Sample Size (EDA): 5000

Model Population Range: It is auto-populated based on the data in the risk factor table. The maximum would be 10 years older from the latest available date. In case you think, older data is not relevant, of date range can be updated.

- Model Evaluation:
  - Type of scaling: min Max Scaler
  - Threshold R2: 0.65
  - Outlier capping: 1.5 Percentile
  - Multi-collinearity Threshold: 0.7

24.7.4 Editing Prepayment Model Analysis Rule

To edit a rule, perform the following steps:

1. Navigate to the **Prepayment Model Analysis** window.
2. Search for the Prepayment Model Analysis Rule that you want to edit.

   For more information, see the Search for Rules section.
3. Select the Prepayment Model Analysis rule. Click **Edit** to open the rule you want to update. You cannot edit more than one Prepayment Model Analysis Rule at a time.

   The Edit Definition window is displayed.
4. Modify the details, the only model type can be changed from Linear to Polynomial or vice versa, and click **Apply**.
5. Click **Save** to navigate back to the Prepayment Model Analysis Summary Window.

24.7.5 Deleting Prepayment Model Analysis Rule

You can delete rules that are no longer required.

> **NOTE** You cannot retrieve a rule once you delete it.

The following are the restrictions for deleting the rules:

- You cannot delete rules if you have only Read privileges. Only users with Read/Write privilege and rule owners can delete models.
- You cannot delete a rule that has a dependency that is model is being used in any of the Prepayment Matrix to calculate Prepayment Rates.

To delete a rule, follow these steps:

1. Navigate to the Prepayment Model Analysis Window.
2. Search for a **Prepayment Model Analysis** Rule.

   For further information, see the Search for Rules section.
3. Select the Prepayment Model Analysis Appropriate Rule and click Delete.

24.7.6 Copying Prepayment Model Analysis Rule

You can copy rules to avoid having to enter data multiple times. This saves time and effort, and also reduces mistakes.

To copy a rule, follow these steps:

1. Navigate to the **Prepayment Model Analysis** Window.
2. Search for a Prepayment Model Analysis Rule.

   For further information, see the Search for Rules section.

3. Select the appropriate Prepayment Model Analysis Rule and click **Copy** to duplicate the rule.
4. Select a folder where you want to save the Prepayment Model Analysis Rule copy.
5. Enter a unique name for the new Prepayment Model Analysis Rule.
6. Enter a brief description of the rule. (Optional)
7. Select the access type.
8. Click **Save**.

24.7.7 Dependency Checking

You can check dependencies for rules to know where a particular Rule, Dimension, Member, Attribute, and IRC are used. This also prevents the accidental deletion of rules having dependencies.

To check the dependency of a Prepayment Model Analysis Rule, follow these steps:

1. Navigate to the **Prepayment Model Analysis** window.
2. Search for a Prepayment Model Analysis Rule.

   For more information, see the Search for Rules section.
3. Select the appropriate Prepayment Model Analysis Rule or rules and click **Check Dependencies** corresponding to the rule that you want to check for.

   You can select more than one rule at a time to check dependencies.

   The Dependency Information window opens containing the following information: Child Object Name, Child Object Type, Folder, Parent Object Name, Parent Object Type, and Folder.

   Note that you cannot delete a Child Object that has dependencies. A message is displayed: Dependencies found. Cannot delete.

   To delete the Child Object, you must first delete the outermost Parent Object that is linked to the Child Object.

24.8 Prepayment Rate Calculation Process

Prepayment Events are associated with Assets and Liabilities that have fixed maturities and have experienced a full Prepayment and Partial Prepayment. Any prepaid amount that causes a change to scheduled contractual cash flows on a Fixed Maturity Instrument, results in a prepaid event and needs to be captured.

This section covers the following topics:

- Overview of Prepayment Rate Calculation Process
- Creating a Prepayment Rate Calculation Process
- Executing a Prepayment Rate Calculation Process
- Performance Tuning Prepayment Rate Calculation Processes

24.8.1 Overview of Prepayment Rate Calculation Process

The Prepayment Rate Calculation Process allows you to perform the following tasks:

- Determine the data that you want to process (Product Selection Block).
- Specify the parameters for the process. The parameters include As-of-Dates Reference Term, Threshold Prepaid Amount, and Market Rate Calculation parameters.
- Execute or run the Prepayment Rate Calculation request and generate results (Prepayment Rate Calculation Process Summary Page).

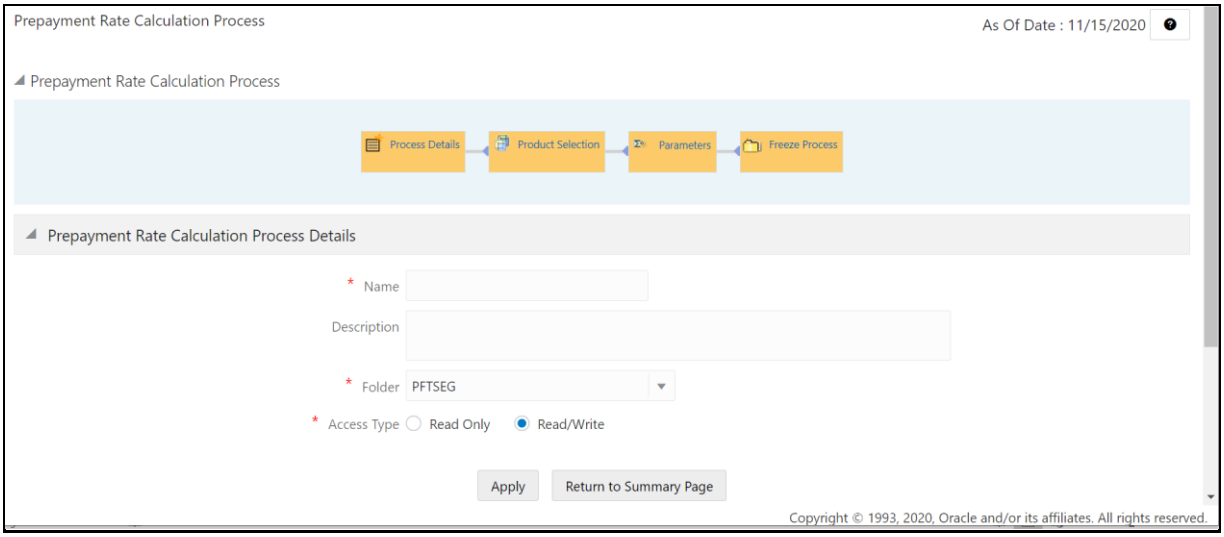
24.8.2 Creating a Prepayment Rate Calculation Process

To define and execute a Prepayment Rate Calculation Process. The Prepayment Rate Calculation Process compares the current period Instrument Data with prior period Instrument Data to identify Prepaid Events. When prepayments are detected, the related instrument records are copied into the FSI_O_HIST_PPMT_RATE_DETAILS table. This table then becomes the source table for Prepayment Rates Modelling.

To create a Prepayment Calculation Process, follow these steps:

1. From the LHS menu, select **Balance Sheet Planning**, select **BSP Processing**, and then select **Prepayment Rate Calculation Process** to display the **Prepayment Rate Calculation Process** Screen.

Figure 183: Prepayment Rate Calculation Process



The following table describes key terms used for this procedure.

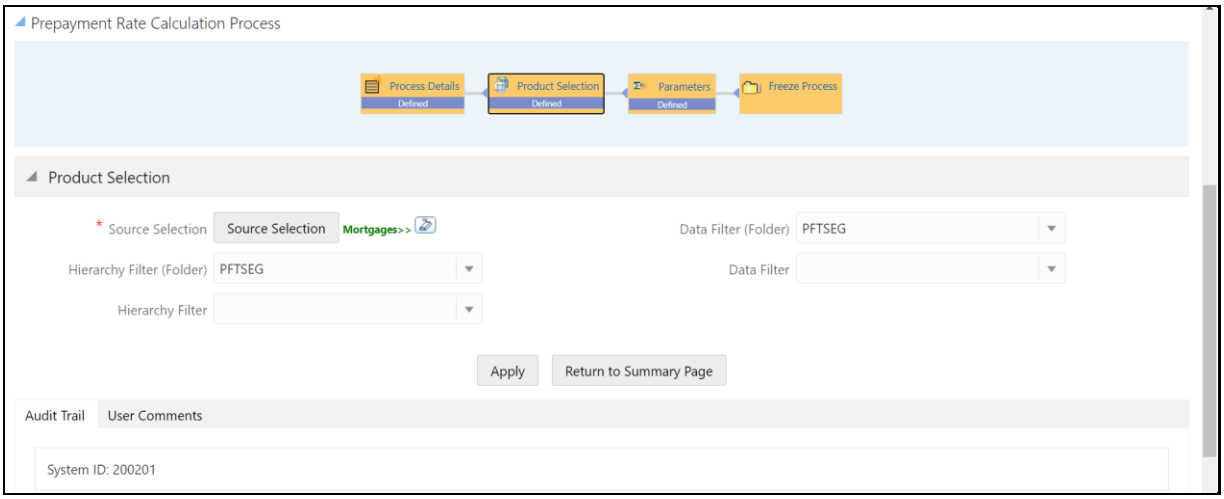
Figure 184: Fields and Descriptions from Prepayment Calculation Process screen

Term	Description
Folder	The folder where you can save the definition. You can give other users, Read/Write or Read Only privileges.

Term	Description
Filter	Filters allow you to restrict your data selection based on any attribute that exists within an instrument table. You define filters under Common Object Maintenance and reference your filter within the Product Selection Block of your Process. The choice of the data filter determines the Instrument Records that need to be picked up from the As-of-Date and the prior period date for comparative analysis. The supported Filter Types are Data Filter, Hierarchy Filter.
Source	Allows you to select one or more source Instrument tables to include in your process. Based on the Instrument Table(s) selected, the instrument records on the As-of-Date and the Prior Period Date are chosen for comparison.
Minimum Prepaid Amount	Minimum Prepaid Amount applies to both Positive and Negative Prepaid Amounts. If the user enters minimum prepaid as 1000, it means that the Minimum Prepaid Amount ranges from -1000 to +1000. If the Prepaid Amount that is calculated is less than or equal to the Minimum Prepaid Amount, then it is ignored from further calculations.
Freeze Process	The freeze process block allows you to finalize the assumptions made in the Process Definition Flow or to clear all assumptions.

2. Create a new Prepayment Rate Calculation Process.
3. Product Selection Block:

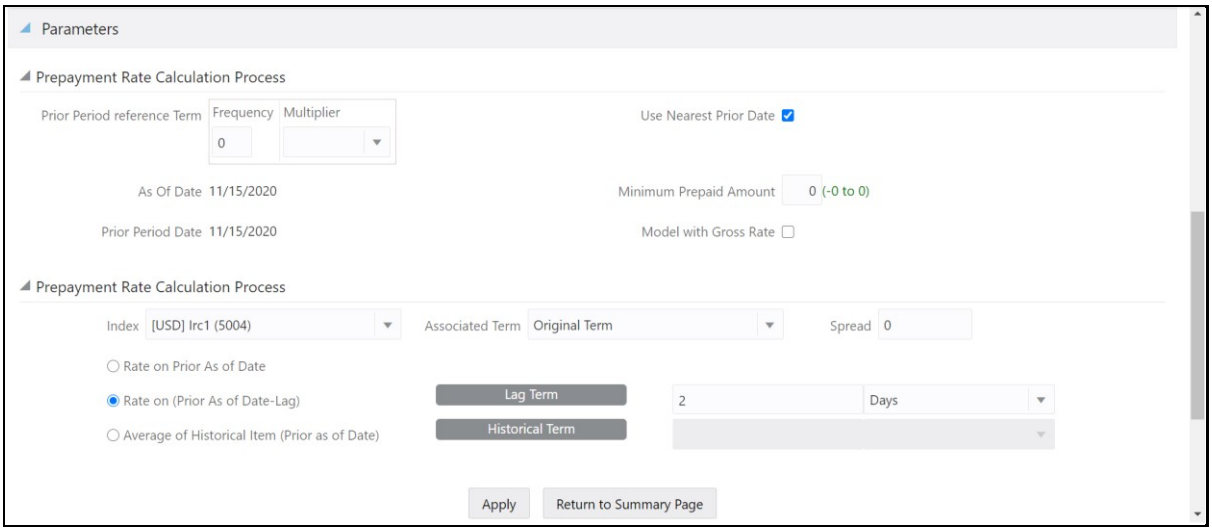
Figure 185: Prepayment Rate Calculation Process – Product Selection Block



- Select a Filter (optional) to constrain the data to be included in the process.
- Select the Source Table(s) that you want to include in the process.

4. Parameters:

Figure 186: Prepayment Rate Calculation Process - Parameters



- Input the Minimum Prepaid Amount as a positive value. The engine applies the Absolute Value of the amount input ranging from - Input Amount to + Input Amount. For example, if the input is 100, then prepaid amounts between -100 and +100 are excluded. This input allows you to filter small/insignificant prepaid amounts, reducing the amount of data copied into the risk factor table for the further modelling process.
- Note there are two approaches for determining the Prior Period Date. You can input the Prior Period Reference Term and based on the current As-of-Date set in application preferences, the Prior Period Date will be calculated, or you can select the "Use Nearest Prior Date" option, and the engine looks back at the historical data to determine the nearest prior As-of-Date and uses this as Prior Period Date.
- One of the risk factors is Customer Rate. It is generally picked from CUR_NET_RATE, but f the user has specifically chosen Gross Rate from UI by checking 'Model with Gross Rate", CUR_GROSS_RATE is picked from the Instrument Record.

5. Market Rate Calculation Parameters:

   You must select an IRC from the list of IRCs defined in Rate Management > Interest Rates. The selected IRC (Index in Parameter Screen) provides the base value for the Market Rate.

   Spread can be Positive as well as Negative values and both are to be added to Base Market Rate. Therefore, if the Base Market Rate is 5 and the spread given is 1.2, the final rate is 5+ (1.2) = 6.2

   Similarly, if spread is -1.2, then final market rate is 5+ (-1.2) = 3.8

   Additionally, you must specify the reference term you want to use for IRCs that are yield curves.

   The following are the options for you to select:

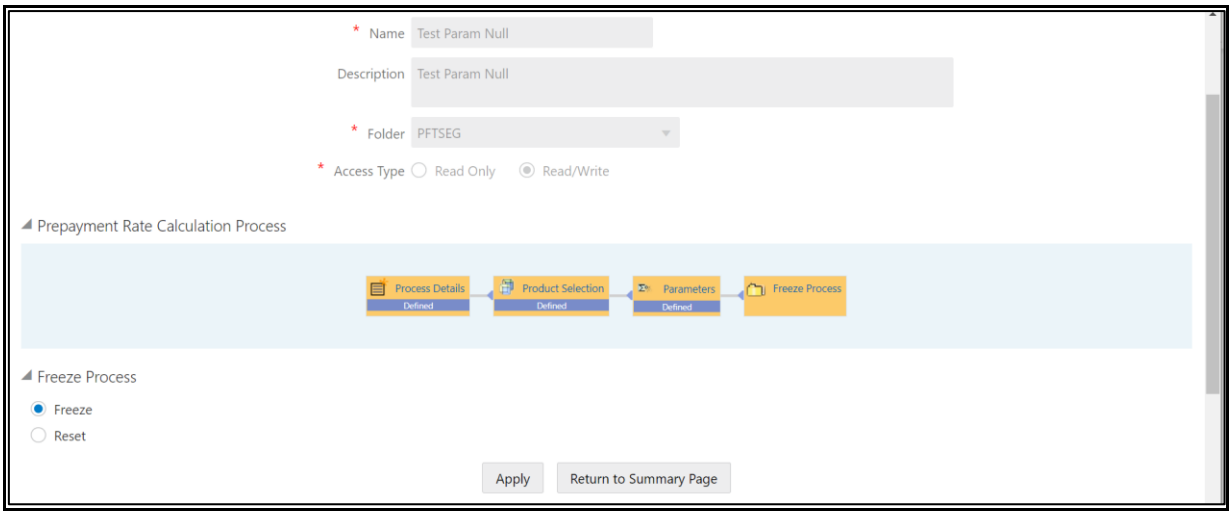
   - Original Term: The calculation retrieves the Interest Rate from the term point equaling the Original Term on the instrument.
   - Reprice Frequency: The calculation retrieves the Interest Rate from the term point equaling the Reprice Frequency of the instrument. If the instrument is fixed rate and, therefore, does not have a Reprice Frequency, the calculation retrieves the Interest Rate associated with the term point equaling the Original Term on the instrument.
   - Remaining Term: The calculation retrieves the Interest Rate from the term point equaling the remaining term of the instrument.

Effective Date for Market rate Curve:

- Select the Market Rate as per the given curve for prior As-of-Date.
- Select the Market Rate with some lag say 15 days, 30 days. Lag Term can be defined with a drop-down containing days, months, and years.
- Similarly, the market rate can be defined as an arithmetic average over a historical range of 1 month, 6 months starting prior As-of-Date. The Historical term is also given with a drop-down containing days, months, and years.

6. Click **Freeze Process**:

Figure 187: Prepayment Rate Calculation Process – Freeze Process



7. Select **Freeze** to complete the process.
8. Select **Reset** to erase all selections made previously within the Process Definition Flow.
9. Select **Confirm**.

24.8.3 Editing an Existing Prepayment Rate Calculation Process

This section details the procedures for viewing, editing, copying, and deleting and existing Prepayment Rate Calculation Process.

24.8.3.1 Viewing Prepayment Rate Calculation Process

To view any of the saved processes, you can select the process, using the check box next to each process, and click on the View button.

24.8.3.2 Editing Prepayment Rate Calculation Process

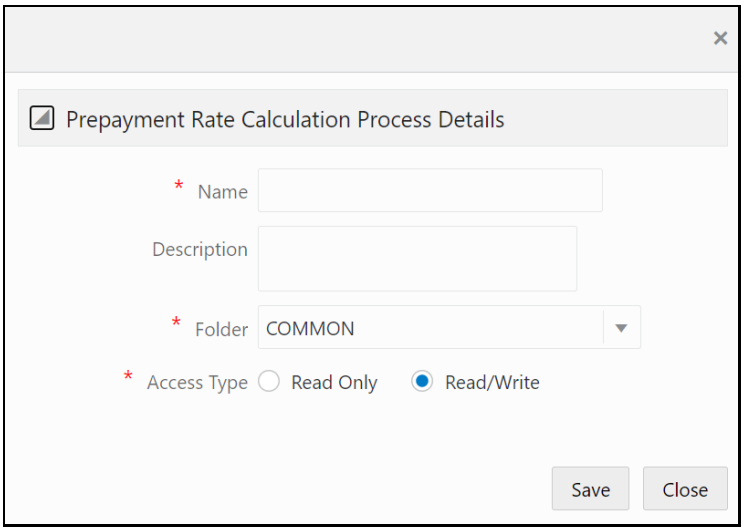
To edit any of the saved processes parameters, you can select the process, using the check box next to each process, and click on the Edit button.

24.8.3.3 Copying Prepayment Rate Calculation Process

To copy any of the saved processes, you can select the process, using the check box next to each process, and click on the Copy button.

The following window opens to confirm the Name, Folder, and Access Type for the copied process:

Figure 188: Editing Prepayment Rate Calculation Process - Details



Enter the details and click Save to save the details.

24.8.3.4 Deleting Prepayment Rate Calculation Process

To delete any of the saved processes, you can select the process, using the check box next to each process, and click on delete.

24.8.4 Executing a Prepayment Rate Calculation Process

You execute a Prepayment Rate Calculation to compare Current Period and Prior Period Data to identify different prepayment events.

Performing basic steps for creating or editing a Prepayment Rate Calculation Process is the prerequisite for this.

Procedure

Following two approaches are available to execute the process:

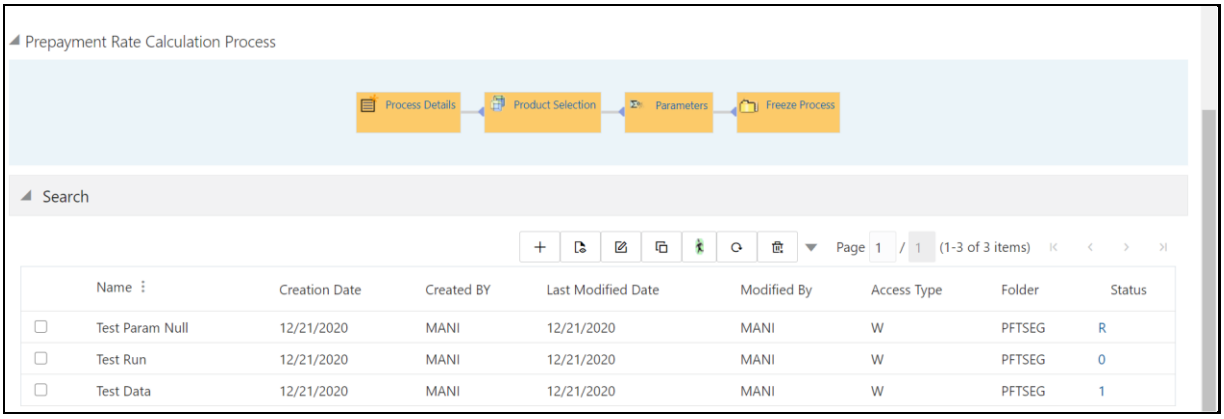
- UI Based Procedure
- Batch Based Procedure

24.8.4.1 UI Based Procedure

To execute the process using UI based procedure, follow these steps:

1. Navigate to the Prepayment Rate Calculation Process Summary Page.

Figure 189: Executing a Prepayment Rate Calculation Process using UI based procedure



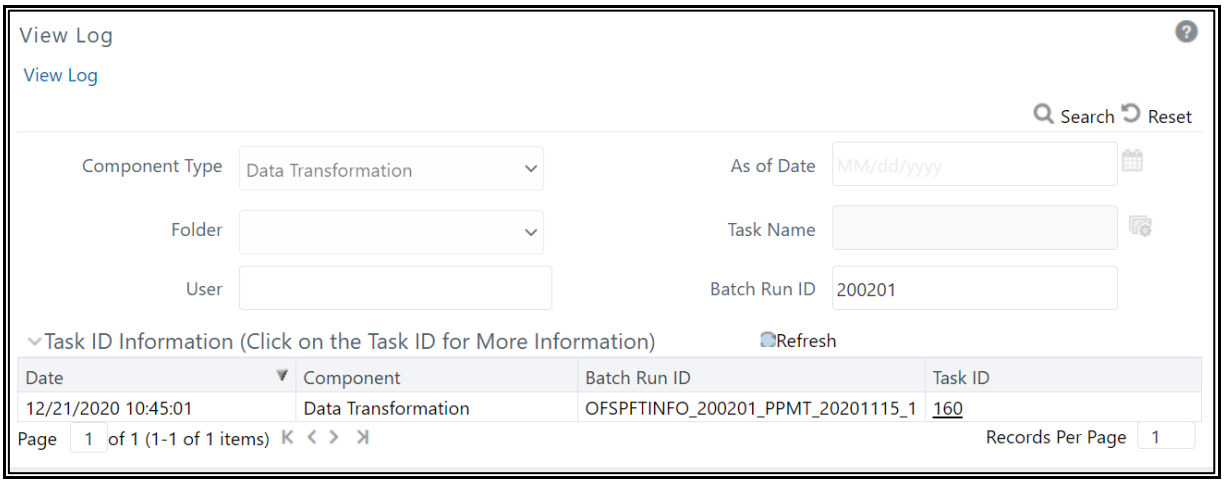
2. Select a Process that you want to execute or Run.

NOTE The status column indicates whether a process can be Run. The following are the possible status conditions:

- Complete: Indicates the process is fully defined and ready to be Run.
- Incomplete: Indicates the process is partially defined and cannot be Run.
- View Log: Indicates the process has already been Run and also indicates a process can be re-Run. In this case, View Log is a hyperlink that allows you to navigate to the Log Viewer Page where you can review any processing errors or alerts related to this process.

3. After executing the preceding process, select the View Log Hyperlink.

Figure 190: View Log



4. Select the Task ID (also known as the Unique System Identifier) to view a report for any processing errors.

> **NOTE** If significant processing errors exist, you should re-Run your process.

5. The Prepayment Rate Calculation Process is complete.

24.8.4.2 Batch Based Procedure

Prepayment Rate Calculation Processes can also be executed as batch processes. The following approaches are available:

24.8.4.2.1 Simplified Batch

To execute the batch with Simplified Batch, follow these steps:

1. From the LHS menu, select **Financial Services Applications**, select **Administration**, and then select **Simplified Batch**.
2. Create a New Simplified Batch.
3. Select Task Type as **Transform Data**.
4. Select **Prepaid_Detection** from the list of seeded process types.
5. Input the following in the Optional Parameters text box:

   'Prepaid Detection Process System ID','User ID', for example, '200883','TPUSER'
6. Save the rule and execute.

24.8.4.2.2 ICC Batch

To execute the batch with ICC Batch, follow these steps:

1. From the LHS menu, select **Financial Services Applications**, select **Operations**, and then select **Batch Maintenance**.
2. Create a new batch.
3. Select the **Batch Name** to add the task.
4. Click the **Add** button under the Task Details Section.
5. Define the **Task ID** and **Description**.
6. Select Components as **Transform Data**.
7. Select **Prepaid_Detection** from the list of seeded process types.
8. Input the following required parameters:
   - Prepaid Detection Process System ID
   - User Name.

   These parameters must be given in the following format (Sys ID, User ID), for example, 101000, TPUSER.
9. Save the rule and execute.

24.8.4.2.3 Run Rule Framework

To execute the batch with Run Rule Framework, follow these steps:

1. From the LHS menu, select **Financial Services Applications**, select **Manage Runs**, and then select **Process**.
2. Create a new rule.
3. Define the **Folder**, **Code**, and **Name** of the rule.
4. Select the Component as **Transform Data**.
5. Select **Prepaid_Detection** from the list of seeded process types.
6. Input the following required parameters:
   - Prepaid Detection Process System ID
   - User Name.

   These parameters must be given in the following format (Sys ID, User ID), for example, 101000, TPUSER.
7. Save the rule and execute.

24.8.5 Performance Tuning Prepayment Rate Calculation Processes

Processing time for Prepayment Rate Calculation Processes can be reduced by modifying parallel processing parameters in the FSI_PARALLEL_PARAMETERS table.

Parallel execution-related parameters for Prepayment Rate Calculation are seeded by the application with a process_engine_cd value of "3" in the FSI_PARALLEL_PARAMETER Table.

The Prepayment Rate Calculation Process looks for the value given in the parallel_query field. If the value is given as "ENABLED", the engine uses the PARALLEL_DEGREE input and sets the degree of parallelism for the execution of the queries within the Prepayment Rate Calculation Engine.

The user or implementation team must set these values when they want to take advantage of parallel query executions. The optimal value for the PARALLEL_QUERY input depends on the environment and must be iteratively tested to arrive at the appropriate value.

25 Non-Maturity Products Data Creation Process

To understand the end-user behavior and use the funds available from the Non-Maturity Products portfolio more precisely; in-built PYTHON Models are given. These PYTHON Models need to run on Historical Data like Market Rate, Cur Net rate, Cur Par Bal, and Account Origination Date, to create this data, the Non-Maturity Products Data Creation Process can be leveraged.

Non-Maturity Modeling is comprised of three types of models:

- Core/Volatile Balance segregation
- Decay Rate and corresponding Weighted Average Life Calculation
- Beta Factor or Pass-through Rate Calculations
- For these calculations, the following Portfolio Level Attributes are required:

Instruments in Scope are CASA, Credit Cards, and Ledger Instruments.

- Account Origination Date (To Calculate Vintage/account age)
- Deposit Rate or Bank Rate – CUR_NET_RATE
- Underlying Index (Market Rate) or Reference Rate
- Number of Accounts per vintage
- Portfolio Balance snapped at regular intervals for a given historical period. (CUR_PAR_BAL from each account)

Topics:

25.1 Overview of Data Creation Process

The Data Creation Process allows you to perform the following tasks:

- Defining the Portfolio and the corresponding Historical Period over which data needs to be generated. Select any number of products from the selected Hierarchy and one or multiple currencies to define a portfolio.
- Hierarchy can be defined on any of the product dimensions like Chart of Account, General Ledger accounts, or Product IDs. The system is built in such a way that it can display Hierarchies based on selected Product Dimensions in Application Preferences.
- Process Train is given on each page, so you can keep track of how many stages are defined and how many are yet to be defined.
- Specify the Market Rate Definition and other Process Parameters like Yield Curve Term and Interest Rate Curve Effective Date.
- Review the entered details and all the process parameters.
- Execute the Data Creation Process and generate results.

- Data Generated by Batch UI using following tables:

  FSI_AUDIT_NM_LOAD_BATCH;

  FSI_O_HIST_NM_MODEL_DETAILS;

  FSI_O_IRC_RATE_NM_MODEL;

  FSI_PROCESS_RUN_HISTORY;
- Metadata tables used for NMD Model UI:

  FSI_M_NM_MODEL_DEFINITION;

  FSI_M_NM_MODEL_EDA;

  FSI_M_NM_PASS_THROUGH_RATE;

  FSI_M_NM_STABLE_BALANCE;

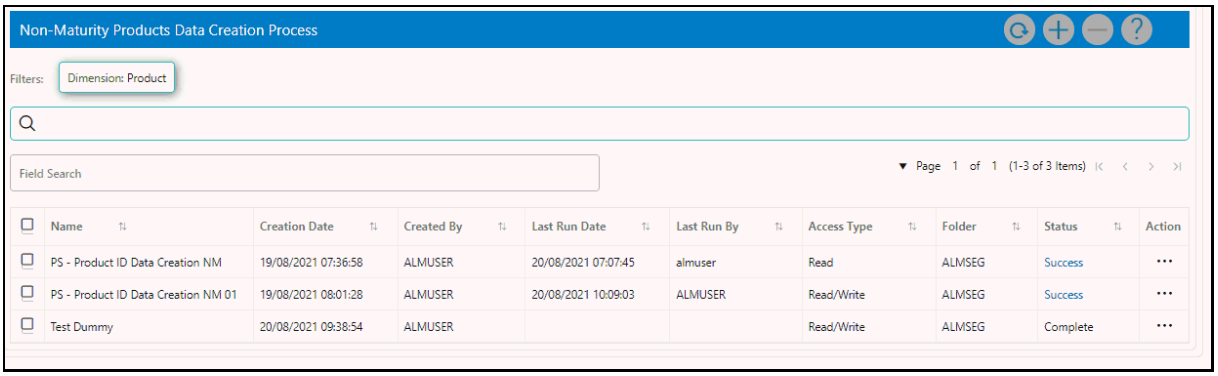
  FSI_M_NM_DECAY_RATE;

  FSI_M_NM_REVIEW_MODEL;

The Data Creation Process Summary Page allows you to do the following:

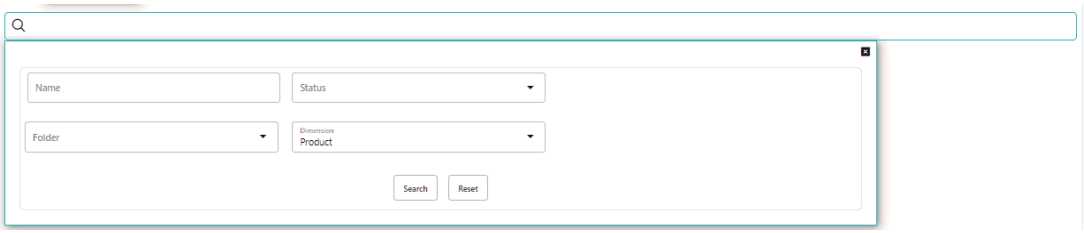
- Create a new process.
- Searching for Data Creation processes: For more information, see the Search for Rules Section.
- Creating Prepayment Models: For more information, see the Create Rules Section.
- Viewing and updating Data Creation processes: For more information, see the View and Edit Rules Section.
- Copying Data Creation processes: For more information, see the Copy Rules Section.
- Deleting Data Creation processes: For more information, see the Delete Rules Section.
- Execute the process.
- View the Execution Details.

Figure 191: Data Creation Process Summary Page



The definitions as per the search criteria will be filtered and shown on the Summary Page. You can specify one or multiple search criteria in this section.

Figure 192: Search Criteria



The Data Creation Process Summary Window displays the following columns:

- Name: Displays the Data Creation Process Rule's name.
- Folder: Displays the Folder name where the Data Creation Process Rule is saved.
- Access Type: Displays the access type of rule. It can be Read-Only or Read/Write.
- Creation Date: Displays the Date and Time when Data Creation Process was created.
- Created By: Displays the Name of the user who created the Data Creation Process.
- Last Run By: Displays the Name of the user who last runs the Data Creation Process.
- Last Run Date: Displays the Date and Time when Data Creation Process was Run last.
- Status: Displays the status of the Rule.
- Action: Displays the list of actions that can be performed on the Data Creation Process Rule. For more information, see the Data Creation Process rule – Icons and Descriptions.

The Action column on the Data Creation Process Summary Page offers several actions that allow you to perform different functions. The following actions are available for the Data Creation Process Rule.

- **Add**: Click the **Add** icon from Top right corner to create a new Data Creation Process Rule.
- **Delete**: Click the **Delete** icon from Top right corner to create a new Data Creation Process Rule.
- **Refresh**: Click the **Refresh** icon from Top right corner to refresh the Data Creation Process Rule.
- **View/Edit**: Click in the **Action** column and select **View/Edit** to view or edit the contents of a Data Creation Process rule in Read/Write Mode.
- **Save As**: Click in the **Action** column and select **Save As** to create a copy of an existing Data Creation Process Rule.
- **Delete**: Click in the **Action** column and select **Delete** to delete an existing Data Creation Process Rule.
- Execute: Click in the **Action** column and select **Execute** to execute an existing Data Creation Process rule. For more information, see Executing Data Creation Process Section.

For more information, see the following sections:

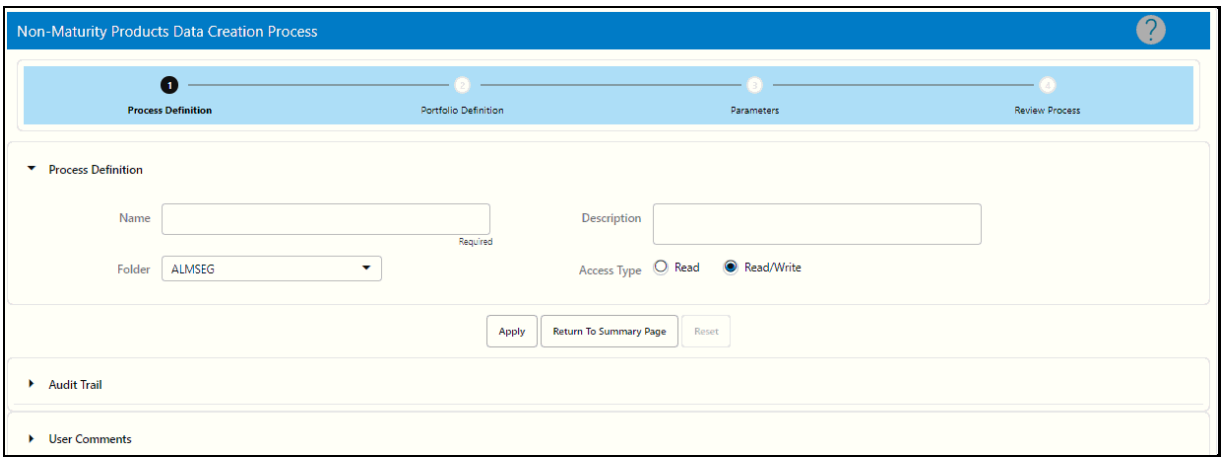
- Creating Data Creation Processes
- Executing Data Creation Processes

25.2 Creating Data Creation Process

To create a new Data Creation process, perform the following steps:

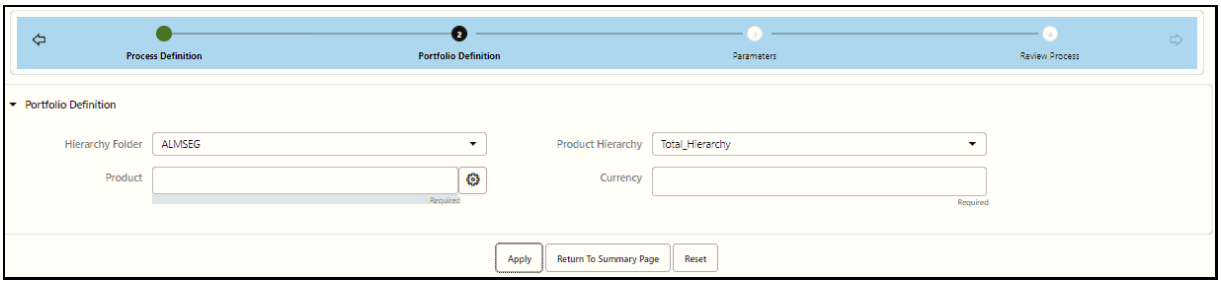
1. Navigate to the **Data Creation Process Summary** Page.
2. Click **Add**. The **Create Data Creation Process Page** is displayed.

Figure 193: Creating Data Creation Process



3. Enter the following details:
   - **Name**: Enter the name of the Data Creation Process Rule. The Data Creation Process Name should be unique. Any special characters are not applicable.
   - **Description**: Enter the description of the Data Creation Process Rule.
   - **Folder**: Select the Folder where the Data Creation Process needs to be saved.
   - **Access Type**: Select the Access Type as Read-Only or Read/Write.
4. Click **Apply** to navigate to the Product Selection Section.

Figure 194: Product Definition Section

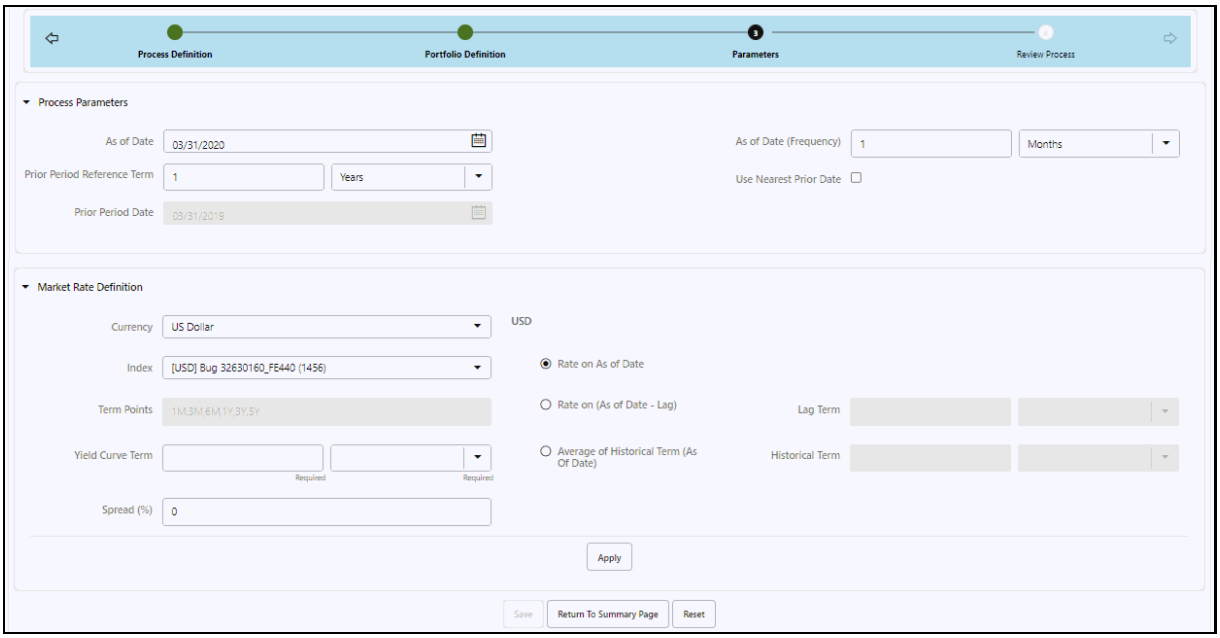


5. Enter the following Portfolio Selection details:
   - **Hierarchy (Folder)**: Select the Folder from which you want to pick the Hierarchy.
   - **Product Hierarchy**: You can specify some processing parameters at product-currency combination. Hierarchies in the selected Folder will be listed and you can select one from the available list of Hierarchies.
   - **Product**: Select the product. This field shows the Product list based on any node/leaf or any combination.

- **Currency**: Select the Currency. The Currency drop-down displays the list of active currencies. You can select multiple currencies as well.

6. Click **Apply** to navigate to the Parameters Section.

Figure 195: Parameters Section



7. Enter the Parameters as shown in the following table:

Table 36: List of Parameters details used for Creating Data Creation Process

Parameter	Description
As of Date	As of Date and prior period reference term allows you to define the period. By default, As of Date is picked from Application Preferences. Here, you can change this date if required.
Prior Period Reference Term	As per the prior period reference term (default value 1 Year), the prior period date is auto calculated.
Prior Period Date	Displays the Prior Period Date. You cannot edit this field as it is calculated as per the Prior Period Reference Term.
As of Date (Frequency)	The Default value of this field is 1 month. As of Date (Frequency) is provided to select any value in days, months, or years as 1 Day, 3 Months, 1 Year, and so on. So, starting prior period date, data snaps will be taken at defined snap frequency till As of Date. For each date, EOD balance (CUR_PAR_BAL) for the account on Data Snap Date, Account Origination Date (which will be required to calculate account age/vintage at each Data Snap Date), and Deposit Rate (CUR_NET_RATE) will be captured, along with market-rate as per the index selected.
Use Nearest Prior Date	If Use Nearest Prior Date checkbox is selected, the system picks the nearest date (current period as of date) as per the last successful Run (default checked). If it is selected, then you cannot edit the prior period reference term field and the Prior Period Date is picked from the last successful Run for the same Data Creation Process.

Parameter	Description
Market Rate Definition	The Market Rate Definition parameters allow you to define the Market Rate Parameters such as Index, Currency, Term Points, Yield Curve Term, Spread, and IRC Effective Date. • **Currency**: This will list down all the currencies for which the portfolio is defined in portfolio definition UI. • **Index**: As per the selected currency from the drop-down; all the interest rate curves defined will be given for selection. Users can choose one from which market rate will be picked. • **Term Points**: Shows the term points. • **Yield Curve Term**: As per the selected interest rate curve, the user can choose one term point, the rate corresponding to the selected term point will be picked. For intermediate-term points interpolation is done. • **Spread**: Default value is 0. This field accepts all positive, negative integers/decimals in the range of -100% to +100%), you can enter the spread in a percentage format. Enter the spread in percentage on top of the rate picked from the selected IRC and term point. • **IRC Effective Date**: Rates will be picked as per the IRC effective date selected on one of the following options: ▪ **Rate on As of Date**: Effective Date is same as As of Date. ▪ **Rate on (As of Date- Lag)**: Effective date is As of Date minus some lag. If you select Rate on (As of Date- Lag), then the Lag Term field will be enabled to enter term and tenor. ▪ **Average of Historical Term (As Of Date)**: Effective date is not just one date, but a period starting As of Date; over which arithmetic average will be taken to smooth out any interest rate fluctuations If you select **Average of Historical Term (As Of Date)**, then the **Historical Term** field will be enabled to enter term and tenor.

8. Click **Apply** and navigate to the **Review Process Section**.

   Here, you can review all the entered details in the preceding stages and edit them if required.

9. Verify the changes and click **Apply**.

25.3 Executing Data Creation Process

The Execute option will run the Data Creation Request and create data for the selected portfolio.

A Predefined Data Creation Process is a prerequisite for executing the Data Creation Process.

The following are two approaches to execute the process.

- UI Based Procedure
- Batch Based Procedure

25.3.1 UI Based Procedure

To execute the Data Creation Process, follow these steps:

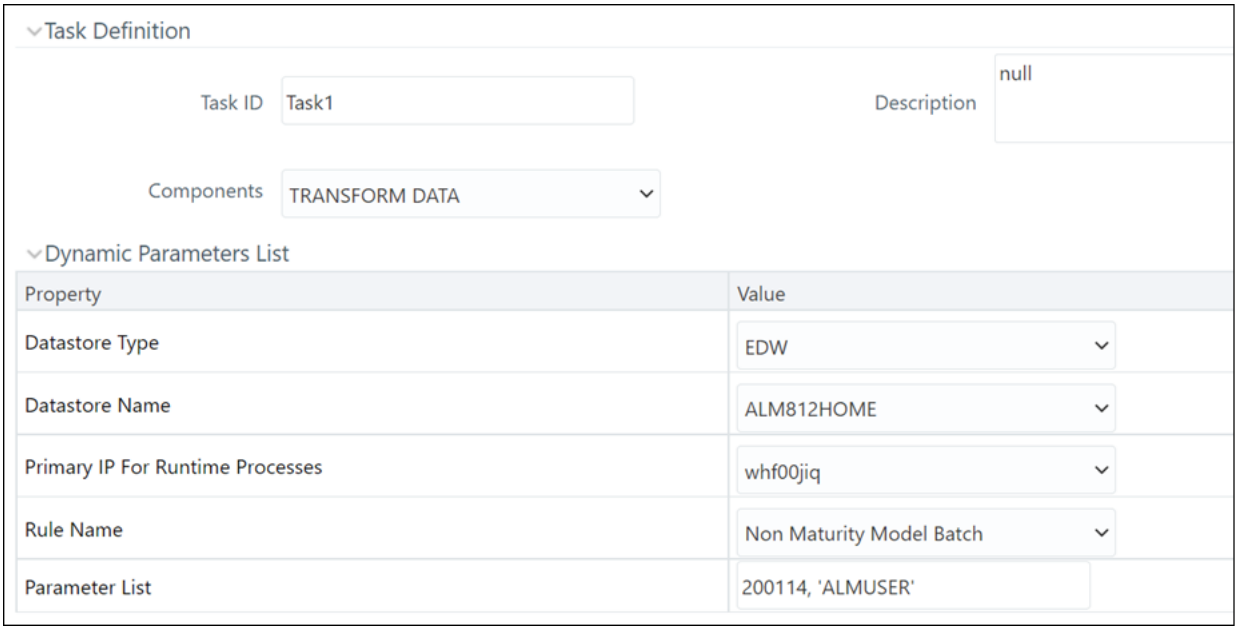
1. Navigate to the **Data Creation Process** Summary Page.
2. Search for a Data Creation Process Rule.
3. Click the ••• icon in the Action column and select Execute to execute an existing Data Creation Process Rule.
4. Click Run.
5. The Data Creation **Process Run Confirmation** Page is displayed. The status of the process is displayed in the **Status** column. After completion of the process, you can navigate to the Execution Details Page by selecting the View Log option. From the Execution Details, you can access a report that provides details of any processing errors that were encountered while running the Data Creation Process.

25.3.2 Batch Based Procedure

To execute the batch with Run Rule Framework, follow these steps:

1. From the LHS menu, select **Common Object Maintenance**, select **Operations**, and then select **Batch Maintenance**.
2. Create a new batch.
3. Select the **Batch Name** to add the task.
4. Click the **Add** button under the Task Details Section.

Figure 196: Task Definition Page



5. Define the Task ID and Description.
6. Select Components as TRANSFORM DATA.

7. Input the following required parameters:
   - **Datastore Type**: Select the appropriate Datastore from the list.
   - **Datastore Name**: Select the appropriate Name from the list.
   - **Primary IP for Runtime Processes**: Select the IP Address from the list.
   - **Rule Name**: Non Maturity Model Batch.
   - **Parameter List**: System ID, User Name.

     Enter the parameters in the following format:

     200114, 'ALMUSER'

     Here, 200114 is System ID and ALMUSER is User Name
8. Save the rule and Execute.

26 Non-Maturity Products Model Analysis

Non-Maturity Products Modeling helps you to understand the relation between Market and Bank Rate, how much is core out of total available balance for the portfolio, and how long core will remain with the bank based on Decay Rate Profile.

Topics:

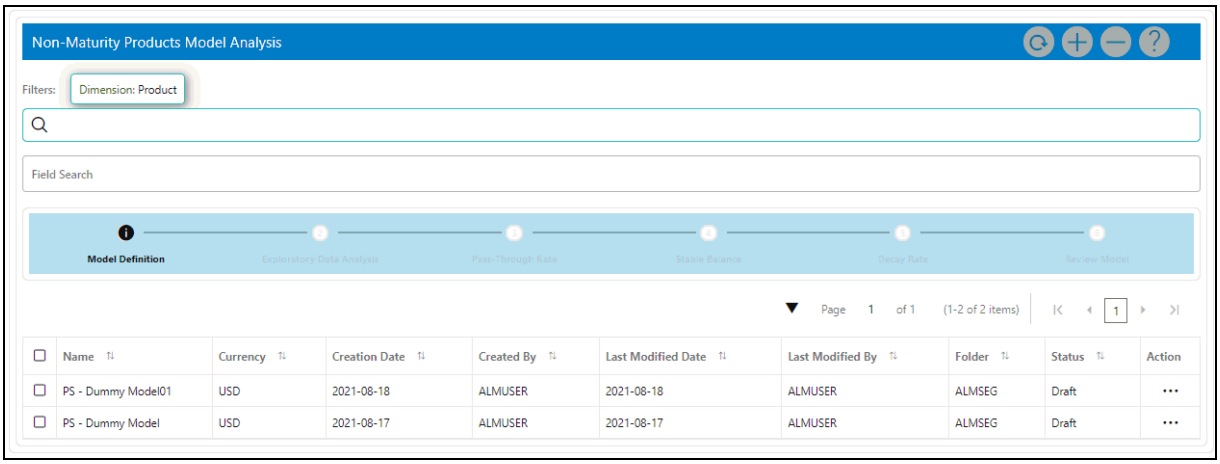
- Overview of Non-Maturity Products Model Analysis
- Searching for a Model Rule
- Creating Non-Maturity Products Model Analysis Rule
- Editing Non-Maturity Products Model Analysis Rule
- Deleting Non-Maturity Products Model Analysis Rule
- Copying Non-Maturity Products Model Analysis Rule
- Dependency Checking

Overview of Non-Maturity Products Model Analysis

The Non-Maturity Products Model Analysis Summary Page allows you to do the following:

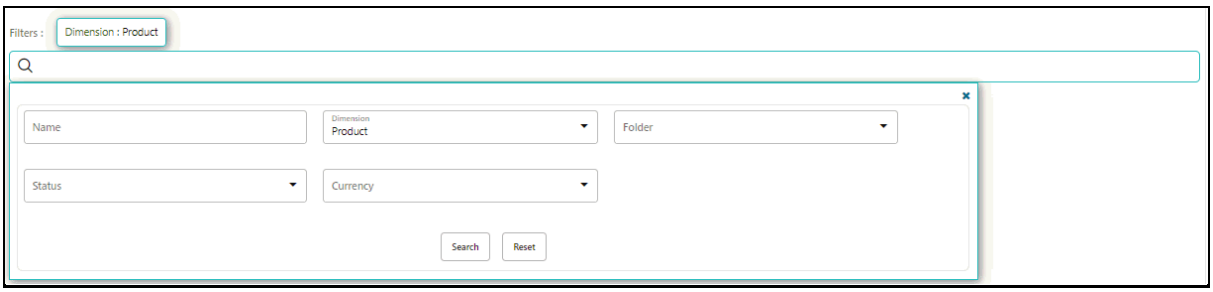
- Create a new Non-Maturity Products Model.
- Searching for Non-Maturity Products Model. For more information, see the Search for Rules Section.
- Viewing and Updating Non-Maturity Products Model. For more information, see the View and Edit Rules Section.
- Copying Non-Maturity Products Model. For more information, see the Copy Rules Section.
- Deleting Non-Maturity Products Model. For more information, see the Delete Rules Section.

Figure 197: Non-Maturity Products Model Analysis Summary Page



The definitions based on the search criteria are listed under the List of Non-Maturity Products Model Analysis. This is the search section that contains multiple parameters. You can specify one or multiple search criteria in this section. When you click Search, depending upon the search criteria, the system filters and displays the list of Non-Maturity Products Models meeting the search criteria.

Figure 198: Search Criteria



The Non-Maturity Products Model Analysis Summary Window displays the following columns:

- **Name**: Displays the Non-Maturity Products Model Analysis Rule's short name.
- **Currency**: Displays the Currency for which Non-Maturity Products Model Analysis Rule is defined. One rule can be created only on one particular currency.
- **Folder**: Displays the Folder name where the Non-Maturity Products Model Analysis Rule is saved.
- **Created By**: Displays the Name of the user who created the Non-Maturity Products Model Analysis Rule.
- **Creation Date**: Displays the Date and Time when Non-Maturity Products Model Analysis Rule was created.
- **Last Modified By**: Displays the Name of the user who last modified the Non-Maturity Products Model Analysis Rule.
- **Last Modified Date**: Displays the Date and Time when Non-Maturity Products Model Analysis Rule was modified last.
- **Status**: Displays the status of the rule. Complete, In Progress, or Failed.
- **Action**: Displays the list of actions that can be performed on the Non-Maturity Products Model Analysis rule. For more information, see Non-Maturity Products Model Analysis Rule- – Icons and Descriptions.

The Action column on the Non-Maturity Products Model Analysis Summary Page offers several actions that allow you to perform different functions. The following actions are available for the Non-Maturity Products Model Analysis Rule:

- **Add**: Click the **Add** icon to create a new Non-Maturity Products Model Analysis Rule.
- **Delete**: Click the **Delete** icon from Top right corner to delete the Non-Maturity Products Model Analysis Rule.
- **Refresh**: Click the Refresh icon from Top right corner to refresh the Non-Maturity Products Model Analysis Rule.
- **View**: Click the ••• in the **Action** column and select View to view the contents of a Non-Maturity Products Model Analysis Rule in Read Mode.

- **Edit**: Click the ••• in the **Action** column and select Edit to edit the contents of a Non-Maturity Products Model Analysis Rule in Read/Write Mode.
- **Save As**: Click the ••• in the **Action** column and select Save As to create a copy of an existing Non-Maturity Products Model Analysis Rule.
- **Delete**: Click the ••• in the **Action** column and select Delete to delete an existing Non-Maturity Products Model Analysis Rule.
- **Dependency Check**: Click the ••• in the Action column and select Check Dependency to check the dependency of an existing Non-Maturity Products Model Analysis Rule.

26.1 Searching for a Non-Maturity Products Model Analysis Rule

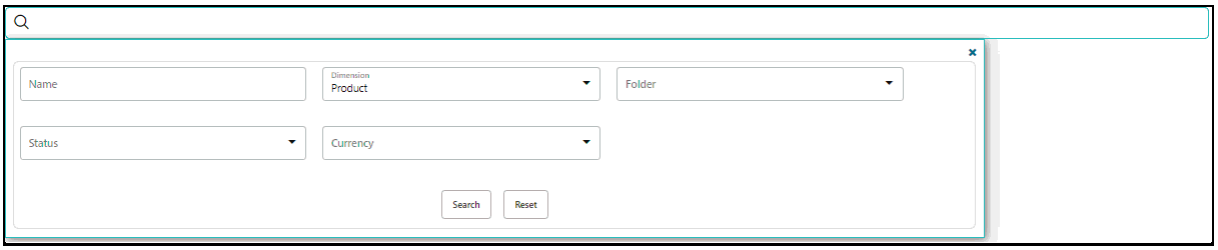
Search for a Model to perform any of the following tasks:

- Update, Copy or Delete existing rules.
- Define methodologies for products or define other model parameters.

To search for a model, follow these steps:

1. Navigate to the Non-Maturity Products Model Analysis Window.
2. Enter the search criteria, one or all of the following details:
   - Name
   - Folder
   - Dimension
   - Currency
   - Status

Figure 199: Search Criteria



3. Click **Search**.

   Only rules that match the search criteria are displayed.

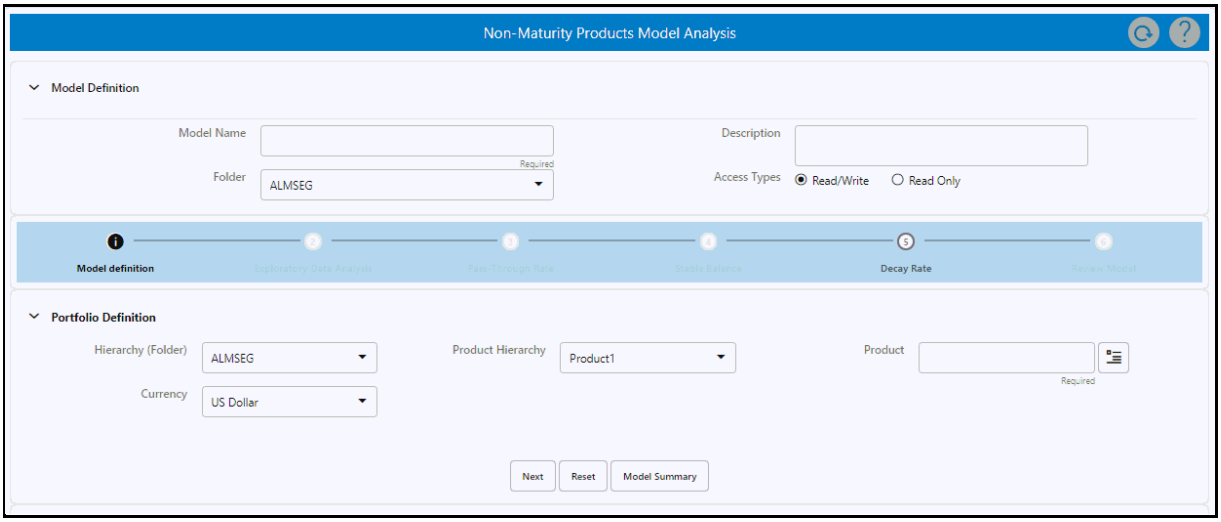
26.2 Creating Non-Maturity Products Model

To create a new Non-Maturity Products Model Analysis Rule, perform the following steps:

1. Navigate to the Non-Maturity Products Model Analysis **Summary** Page.

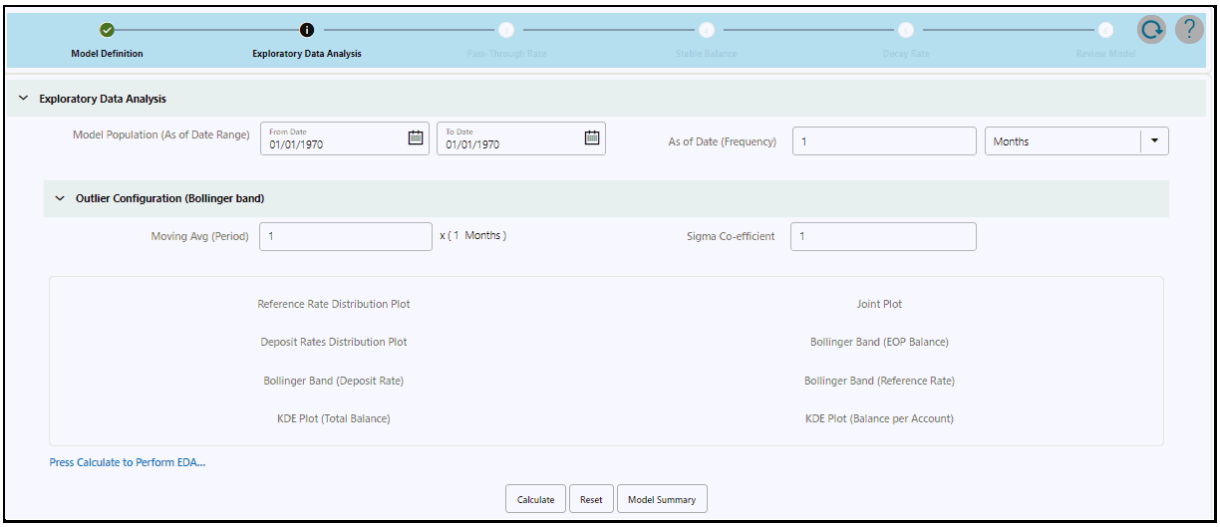
2. Click **Add** . The **Create Non-Maturity Products Model Analysis** Page will be displayed.

Figure 200: Creating Non-Maturity Products Model Analysis Rule



3. Enter the following details.
   - **Model Name**: Enter the name of the Non-Maturity Products Model Analysis Rule. This should be a unique name. This field accepts an alphanumeric value. Special characters are not allowed.
   - **Description**: Enter the description of the Non-Maturity Products Model Analysis Rule. The maximum limit of this field is 300 characters. You can enter special characters in this field.
   - **Folder**: Select the folder where you want to save the Non-Maturity Products Model Analysis Rule.
   - **Access Type**: Select Access Type as Read-only or Read/Write.
   - **Hierarchy (Folder)**: Select the folder where the product is stored on which you want to build the model.
   - **Product Hierarchy**: Select the Product Hierarchy from the available list of hierarchies in the selected folder.
   - **Product**: Based on the selected Product Hierarchy in model definition UI, Hierarchy Browser will expand the Product Hierarchy and you can select any Parent/Leaf Node by clicking on the View button next to the Product in the Model Definition Screen.
   - **Currency**: Select the Currency for the Non-Maturity Products Model Analysis Rule. Only one currency can be selected for a particular model.
4. Click **Apply** to navigate to the **Exploratory Data Analysis** Section.

Figure 201: Exploratory Data Analysis Section



5. The Exploratory Data Analysis Window helps you to perform EDA calculations and get a glimpse of data being used for modeling.
6. Enter the following details in the Exploratory Data Analysis Window.
   - Model Population (As of Date Range) You can select a date range that will define the historical period within which data needs to be picked for Model creation.

     By default, the Date range would be populated as below:

     — **End Date**: Max (As of Date) available in Model input Table.

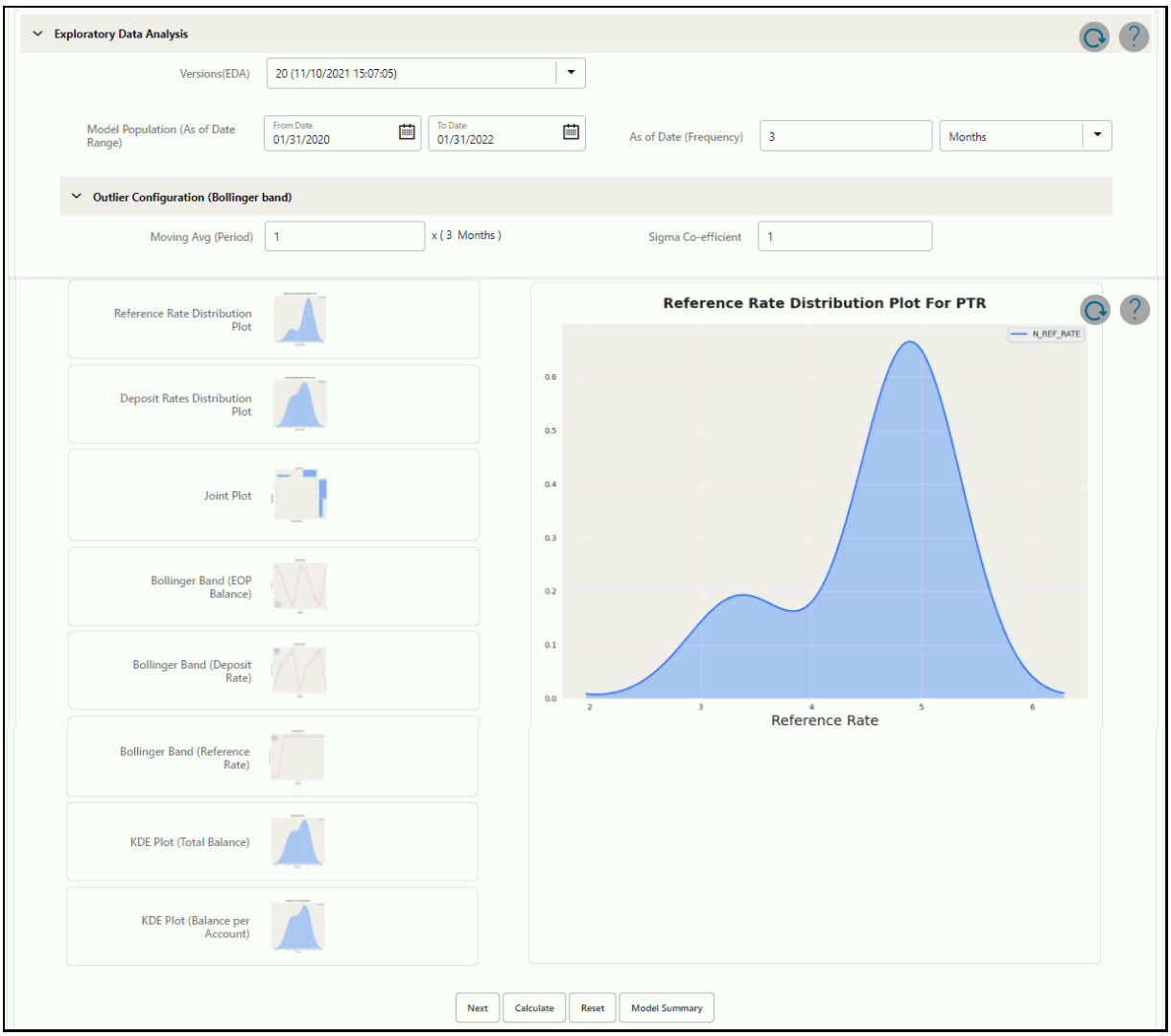
     — **Start Date**: Max [min (As of Date), End Date – 10 Years].

     Default values are populated from the FSI_AUDIT_NM_LOAD_BATCH table.
   - **As of Date (Frequency)**: The default value of this field is one month. As of Date (Frequency) defines on what regular intervals, data needs to be picked from the input table. For example, you can have a Historical Period as last three years, in those three years at what regular interval data needs to be picked up from the History table that would be defined by As of Date (Frequency).
   - **Moving average period for Bollinger Band**: The default value of this field is one month. The Moving Average period defines the historical term over which the moving average needs to be calculated for Bollinger band formation.
   - **Sigma Co-efficient (Bollinger Band)**: The default value of this field is 1. Sigma Co-efficient defines the outliers, any number which is (sigma coefficient * standard deviation) away from the mean, will not be considered for calculations. This field accepts Integer and Decimal values in the range 0 – 10.
7. Click **Calculate** to perform Exploratory Data Analysis and get EDA plots. You can refresh the window using the Refresh button to check if the EDA is completed.

   When you open the EDA window the first time for a particular model, the Version (EDA) field would not appear as there is no previous version to display. Subsequently, when the first version is created and you go for the second version, the version (EDA) tab will start appearing with previous EDA versions. When the EDA Version is submitted, a message will appear with a version number. You get a pop-up in the case the last run version was failed. If the Run was successful, the latest version would appear on the UI, when you log back in.

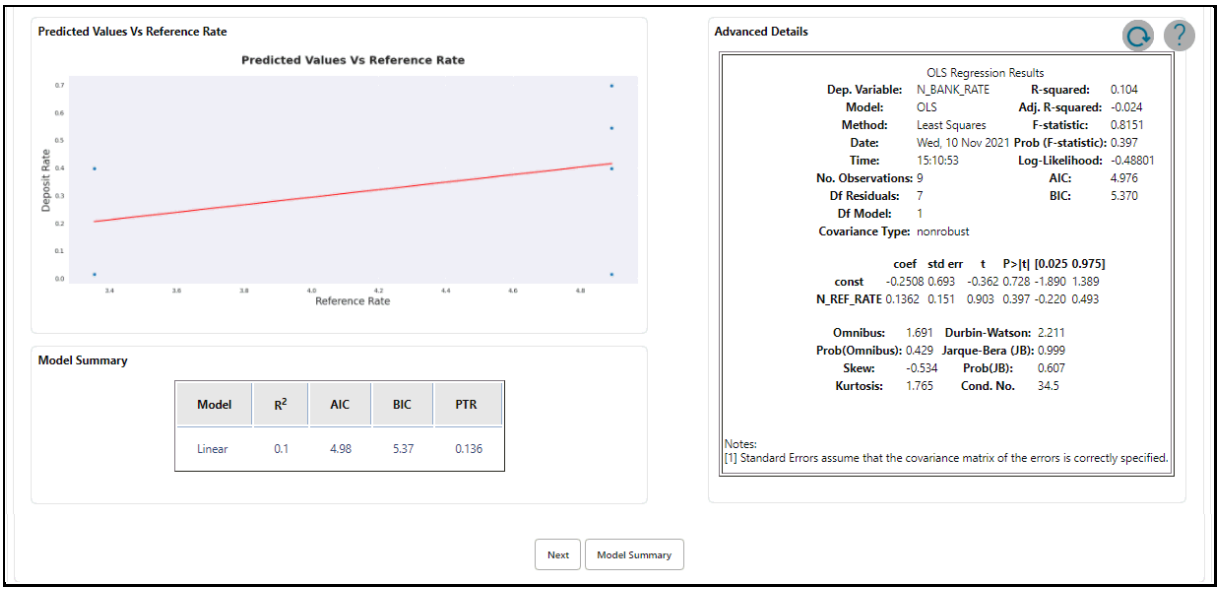
The **Reset** button resets the entered values to their default values.

Figure 202: Exploratory Data Analysis



8. Click **Next** to navigate to the **Pass-Through Rate Calculations** Window.

Figure 203: Pass-Through Rate Calculations

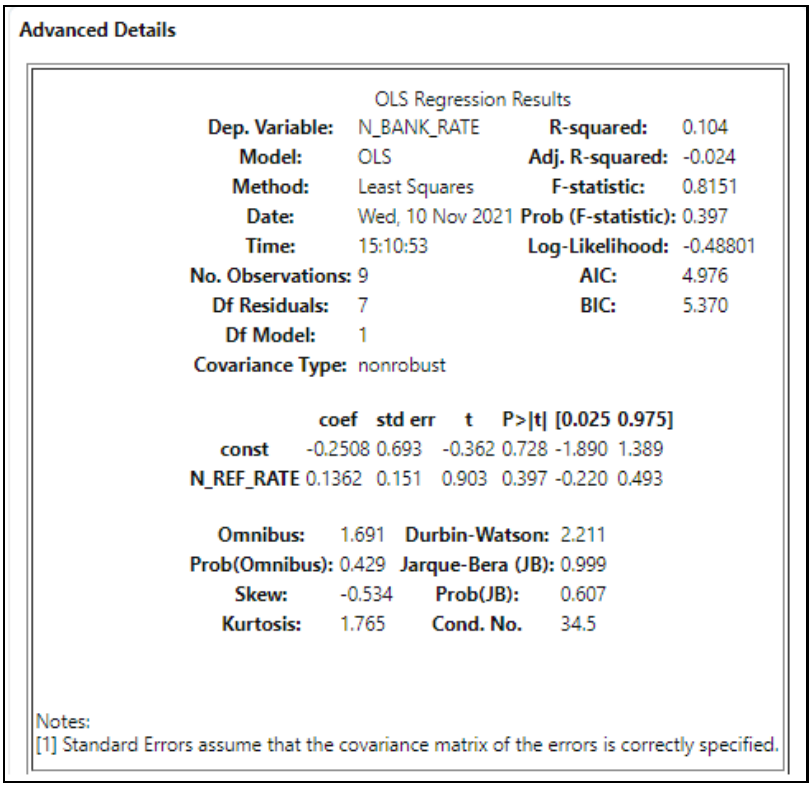


9. Click **Calculate** to view all the evaluation parameters and quality plots. Pass-Through Rate calculations are submitted, a message appears with a version number. If you come back after some time, you get a pop-up in the case the last run version was failed. This window shows all the model quality parameters and graphs. At this stage, the pass through rate or beta between the market rate and deposit rate is calculated.

   You can zoom the graph to enhance visibility.

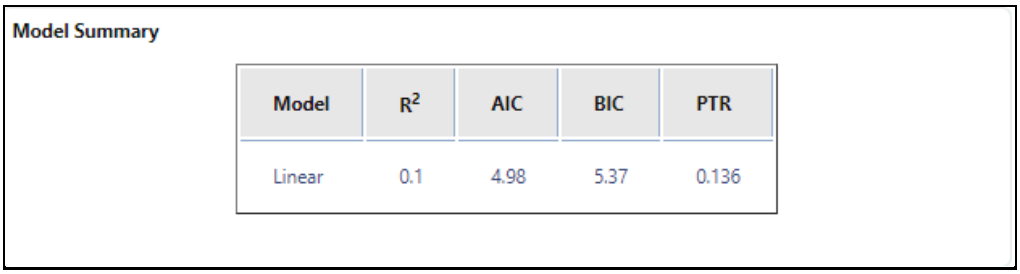
   Following Advanced Details Window will help you to evaluate the model fit.

Figure 204: Advanced Details



The Model parameters like R2, AIC, BIC, and regression co-efficient will be shown under the model summary. (How much change in market rate is passed on to the Deposit Rate)

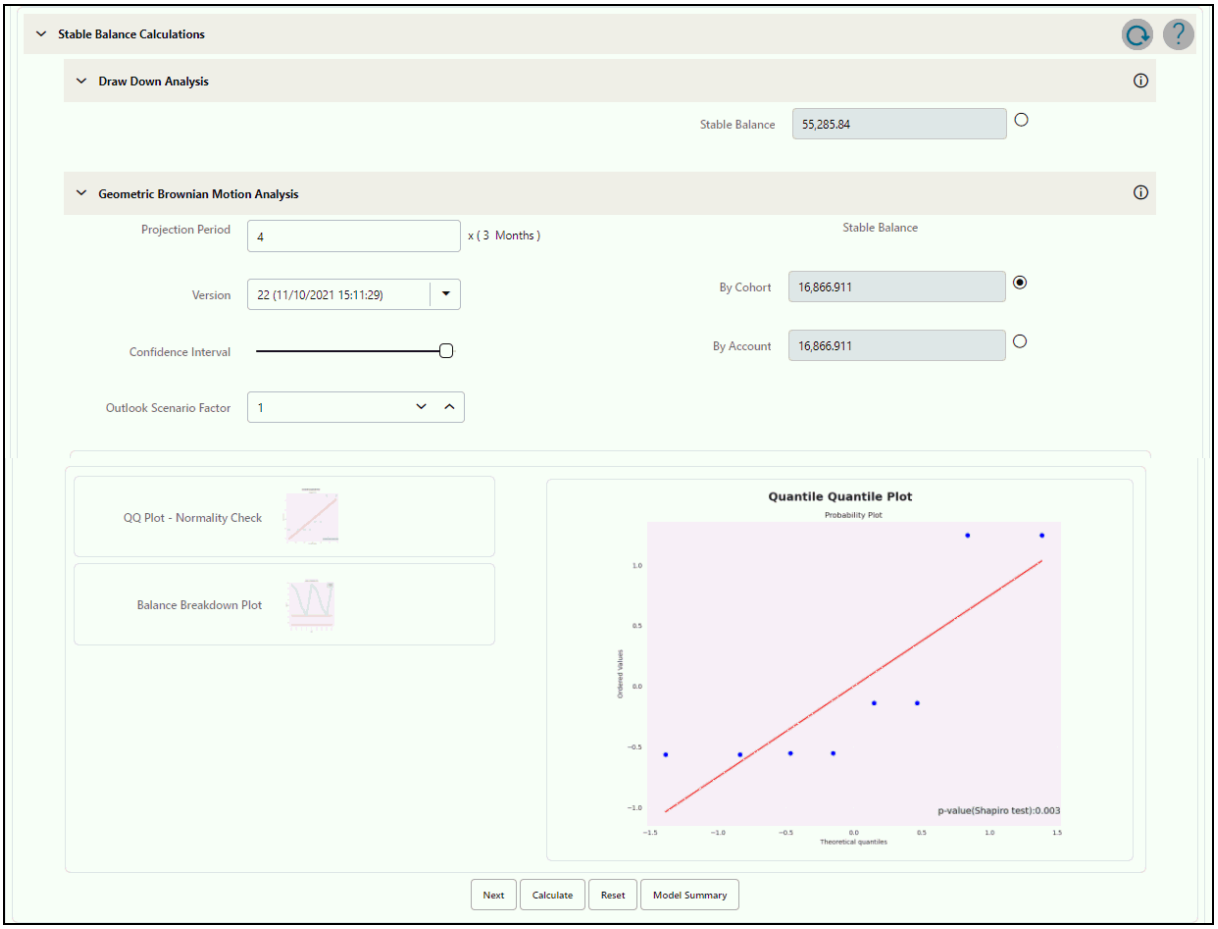
Figure 205: Model Summary



At any stage, if the user would like to come out of the Model Analysis Module, one can click on the Model Summary button and go back to the Non-Maturity Products Model Summary Screen and come out of the Modeling Module.

10. Click **Next** to navigate to the Stable Balance Calculation Section. This window shows the Projection period. You can set it as required. The Projection Period can only be positive integers which will act as a multiplier to As of Date (Freq); For example, if As of Date (Freq) is quarter and projection period is 8 * As of Date (Freq), it implies projection period is two years.

Figure 206: Status Balance Calculation



To calculate Stable Balance, you can use the following methods:

- Draw Down Analysis
- Geometric Brownian Motion
- **Draw Down Analysis**: The Draw Down Analysis calculates each period's Run-offs in the historical period and subtracts the maximum Run-off from the most recent total balance to arrive at a stable balance.
- **Geometric Brownian Motion**: This approach will first calculate the past Run-offs volatility and assuming a normal distribution of Run-offs, accept confidence interval as user input, projection period for time adjustment, and outlook scenario factor (volatility multiplier) as input from the user. After clicking calculate, the stable balance would be shown at cohort/account level using both cohort level and account level volatility and saved against version.

  The confidence interval slider field has a range of 0 – 100% and by default value as 95% and Outlook scenario factor (Volatility Multiplier) is set at 1 (Default Value).

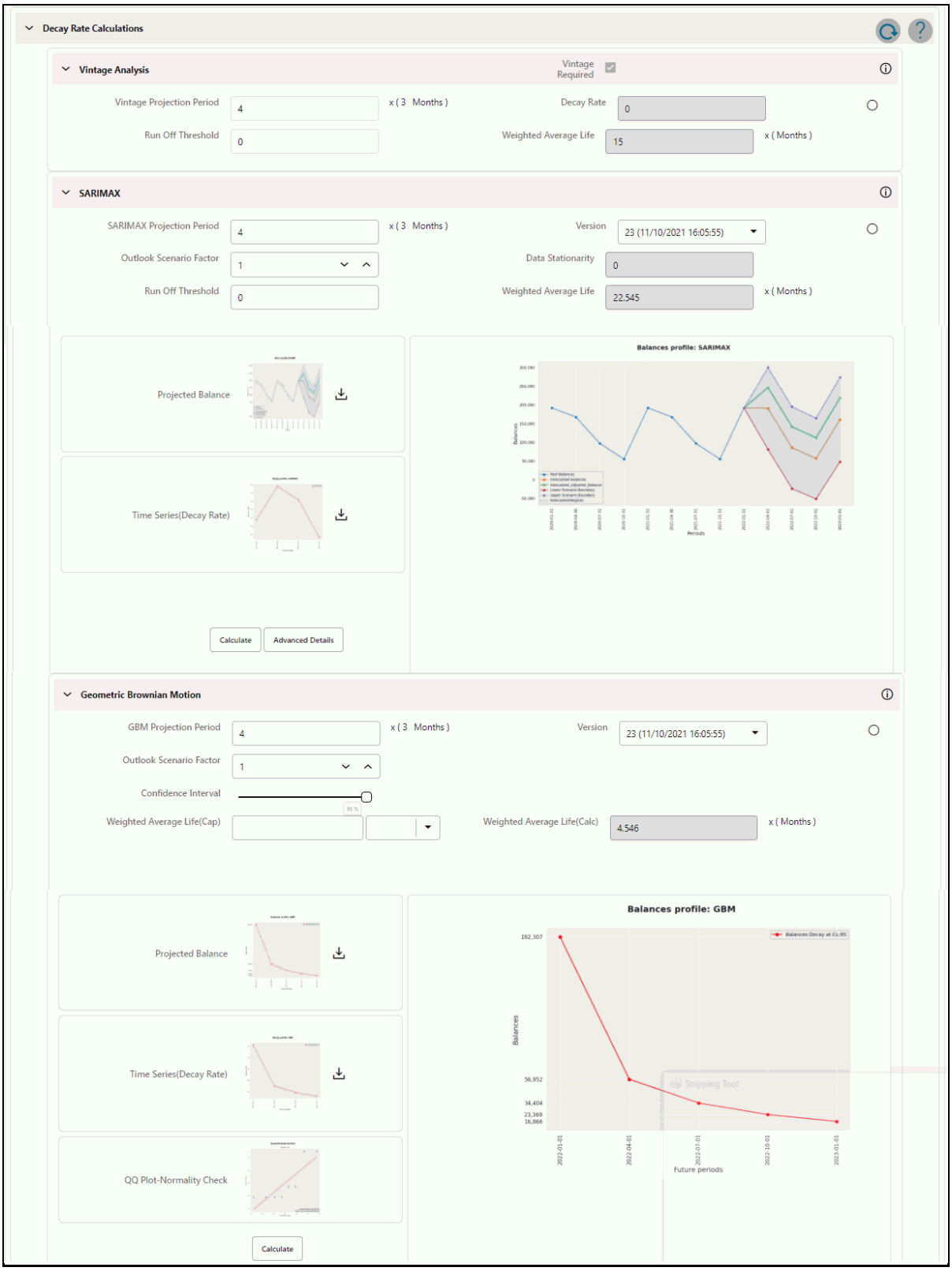
  The range of the outlook scenario factor is 0.01 to 1.99.

  You can change any of the inputs and generate multiple versions.

  A radio button is available for each method. Stable balance can be calculated with multiple methods, so before proceeding to the next step, you must select one radio button to confirm one stable balance on which the rest of the subsequent processing will take place. When this window is displayed the first time, after pressing the Calculate, stable balance is calculated for both methods, Drawdown analysis, and Geometric Brownian Motion. In subsequent runs, if any of the Projection Period, confidence interval, or Scenario factor is changed, then a new version will be generated only for GBM. When you press **Calculate** button, then a pop-up is displayed: " GBM version XYZ is submitted'. If you come back and the version is failed, a pop-up is displayed: "'GBM version xx is failed' and UI will revert back to last successful version".

11. Click **Next** to navigate to the **Decay Rate Calculations** Section.

Figure 207: Decay Rate Calculation



For Decay rate calculations, you can choose any one of the following three approaches:

- **Vintage Analysis**: This method calculates one decay rate value as per the various vintages and regular intervals over which data is being picked for the defined portfolio. The same decay rate is applicable to the whole projection period. Select the Vintage Analysis checkbox if you want to use this in calculation or exclude it from calculations. Vintage Analysis needs account-level data for a complete historical period, which you may not have initially, so you can avoid this method. For other methods, portfolio/cohort level data is required which is comparatively easier to get. By default, this checkbox is not selected to indicate this model is not included in processing.

  You can set the projection period as per your requirement.

- **SARIMAX**: This method creates a future balance profile based on historical balances, along with Run-off volatility multiplied by the Outlook scenario factor (default 1). Based on balance Run-offs, a decay profile is created.

- **Geometric Brownian Motion**: Based on balance Run-off volatility and accepted user inputs like confidence interval and outlook scenario factor, Decay Rates are calculated for each subsequent period in the Projection Period and a decay profile is created.

  Based on the Decay Rate Profile, Run-offs would be calculated and finally, a Balance Profile will be created which will in turn help to calculate WAL.

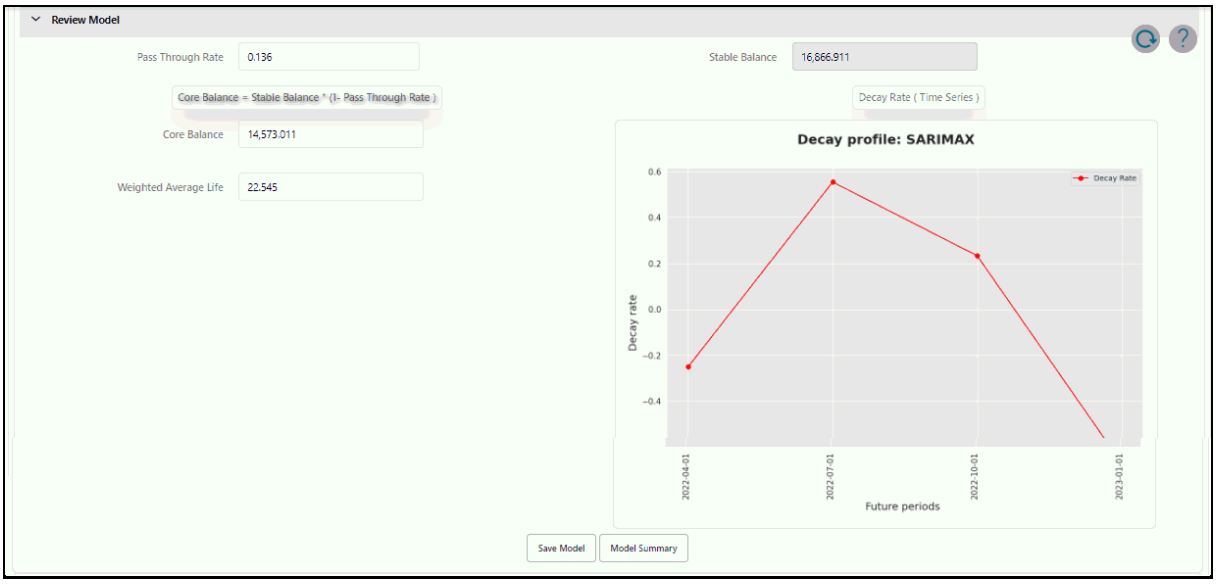
  Based on the Decay Rates profile, the model will do Weighted Average Life (WAL) calculations as well, if WAL is more than defined regulatory WAL (Cap), then the system will let the user define a Confidence Interval Range (and steps (Default 5%) in which Confidence Interval will be increased for each calculation. If the range is 80-95%, then the system generates a Decay Rate Profile at 80%, 85%, 90%, and 95% interval; using an iterative process, try to calculate a Decay Rate Profile which will give WAL within regulatory WAL (Cap) defined by the user. If in a given confidence interval range, WAL is still more than regulatory WAL (Cap), a simple linear Decay Rate Profile would be created.

  The run-off threshold is user input, it will define the minimum balance beyond which WAL calculations would not be performed, considering balance becomes zero at that point.

  When this window is launched the first time and you press Calculate, Decay Rate is calculated for all three methods, Vintage Analysis, SARIMAX, and Geometric Brownian Motion. After the first run (when Calculate button does not appear), separately **Calculate** buttons (as shown with SARIMAX and Geometric Brownian Motion) are available for each of Geometric Brownian motion and SRIMAX.

12. Click Next to navigate to the **Review Model** Section. This section shows the Model details before confirming the model. Here, you cannot edit any details. If you want to update any details, click Model Summary to go back. Until the model is saved, it is always in 'Draft' status. It converts to 'Complete' only when you save the model. For more information on editing, see the Editing Non-Maturity Products Model Analysis Rule section.

Figure 208: Review Model



26.3 Editing Non-Maturity Products Model Analysis Rule

To view and edit a Non-Maturity Products Model Analysis Rule, follow these steps:

1. Navigate to the Rule Summary Page of the rule you want to update.
2. Search for a Rule. For further information, see the Search for Rules Section.
3. Click the ••• in the Action column and select View/Edit to open the rule you want to update.
4. Update the rule details.
   - If the model is confirmed, then only the Stable Balance and Decay Rate profile can be updated.
   - If the model is in Draft, then you can edit all the details except Name, Access Type, and Folder fields.
5. Click **Apply** or **Save**, depending on the Model Status.

26.4 Deleting Non-Maturity Products Model Analysis Rule

You can delete rules that are no longer required.

> **NOTE** A rule cannot be retrieved after deletion.

Restrictions on deleting rules are:

- You cannot delete rules if you have only Read privileges. Only users with read/write privilege and rule owners can delete Model Rules.
- You cannot delete a rule that has a dependency that is model is being used in any of the Behavior Patterns.

To delete a Non-Maturity Products Model Analysis rule, follow these steps:

1. Navigate to the Model Rule Summary Page and select the Rule you want to delete.
2. Click ••• in the Action column and select Delete.

26.5 Copying Non-Maturity Products Model Analysis Rule

You can copy rules to avoid having to enter data multiple times. This saves time and effort and also reduces operational errors.

To copy a Non-Maturity Products Model Analysis Rule, follow these steps:

1. Navigate to the Model **Rule Summary** Page.
2. Search for a Rule.

   For more information, see the Search for Rules Section.
3. Click ••• in the **Action** column and select **Save As** to duplicate the rule.
4. Select a folder where you want to save the rule copy.
5. Enter a unique name for the new rule.

   (Optional) Enter a brief description of the rule.
6. Select the access type.
7. Click the **Save** button.

26.6 Dependency Checking

You can check dependencies for rules to know where a particular model rule is being used. This also prevents the accidental deletion of rules having dependencies.

To check the dependency of the Non-Maturity Products Model Analysis Rule, follow these steps:

1. Navigate to the Model **Rule Summary** Page.
2. Search for a rule. For further information, see the Search for Rules Section.
3. Click ••• in the **Action** column and select **Dependency Check** to the rule that you want to check for.

27 Forecast - Pricing Margins

This module describes the procedure for working with and managing Pricing Margin rules.

This chapter covers the following topics:

27.1 Overview of Pricing Margin Rules

In BSP, Pricing Margin rules allow users to define default pricing margins (or spreads) for their products. Pricing margins are defined period by period based on your active Time Bucket definition, for each product and, potentially, each currency. Pricing margins work together with an underlying base interest rate curve to determine note rate pricing for new business volumes defined through BSP's planning user interfaces. New business assumptions are defined based on the combined inputs from the following three forecast related business rules:

- Product Characteristics
- Forecast - Pricing Margins
- Forecast – Maturity Mix

When you require more complex definitions of pricing margins to model unique account pricing details, user-defined repricing patterns can be used. For more information, see User-defined Repricing Patterns

The procedure for working with and managing Pricing Margin rules is similar to that of other Oracle Balance Sheet Planning business rules. It includes the following steps:

- Searching for Pricing Margin rules. For more information, see the Searching for Rules section.
- Creating Pricing Margin Rules. For more information, see Creating Rules section.
- Viewing and Editing Pricing Margin rules. For more information, see the Viewing and Editing Rules section.
- Copying Pricing Margin rules. For more information, see the Copying Rules section.
- Deleting Pricing Margin rules. For more information, see Deleting Rules section.

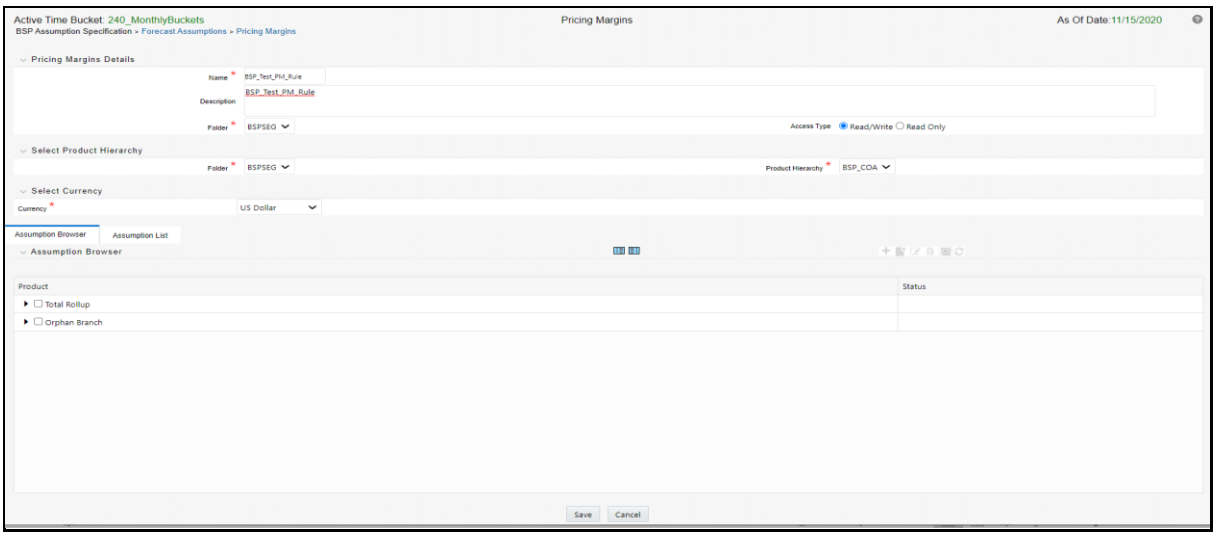
As part of creating and editing Pricing Margin rules, you assign Pricing Margins to applicable products. See Defining Pricing Margin Rules

27.2 Creating Pricing Margin Rules

You create Pricing Margin rules to assign pricing margins (or spreads) to be used in pricing new volumes defined through Forecast Balances business rules.

1. Navigate to the Pricing Margins Rule summary page.
2. Complete standard steps for this procedure.

Figure 209: Pricing Margin Rules Summary Page



NOTE In addition to the standard steps for creating rules, the procedure for creating a Pricing Margins rule involves one extra step. After Standard Step 6, you need to select a product hierarchy. You can define methodologies at any level of the hierarchical product dimension. The hierarchical relationship between nodes allows the inheritance of methodologies from parent nodes to child nodes.

Oracle Balance Sheet Planning provides you with the option to copy, in total or selectively, the product assumptions contained within BSP business rules from one currency to another currency or a set of currencies or from one product to another product or a set of products.

27.3 Defining Pricing Margin Rules

The definition of a Pricing Margins rule is part of the Create or Edit Pricing Margins rule process. When you click Save in the Create Pricing Margins rule process, the rule is saved and the Pricing Margins rule summary page is displayed. However, Pricing Margin assumptions have not yet been defined for any of your products at this point. Typically, you would start defining your Pricing Margin assumptions for product-currency combinations before clicking **Save**.

27.3.1 Defining Pricing Margins Using Node Level Assumptions

Node Level Assumptions allow you to define assumptions at any level of the Product dimension Hierarchy. The Product dimension supports a hierarchical representation of your chart of accounts, so you can take advantage of the parent-child relationships defined for the various nodes of your product hierarchies while defining rules. Children of parent nodes on a hierarchy automatically inherit the assumptions defined for the parent nodes. However, assumptions directly defined for a child take precedence over those at the parent level.

27.3.2 Prerequisites

Performing basic steps for creating or editing a Pricing Margins rule

27.3.3 Procedure

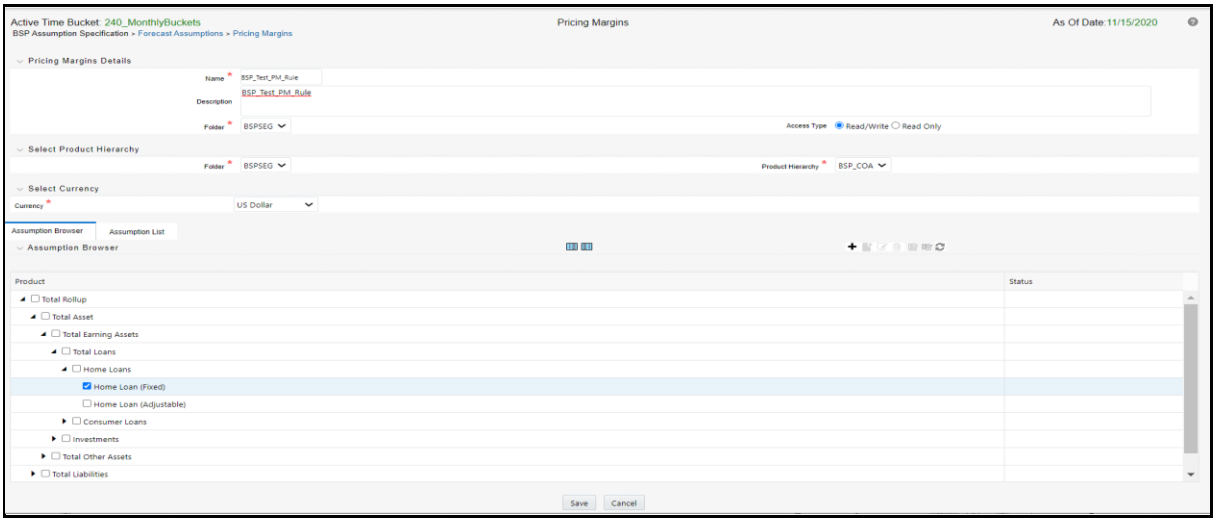
Defining Pricing Margins has two primary steps:

1. Choosing your rate dependency option
2. Inputting Pricing Margin details for the selected products

> **NOTE** Using the default currency to set up assumptions can save data input time. At run time, the calculation engine uses assumptions explicitly defined for a product currency combination. If assumptions are not defined for a currency, the engine uses the assumptions defined for the product and the default currency. If the assumptions are the same across some or all currencies for a specific product, you can input assumptions for the default currency. Be careful using this option on screens where an Interest Rate Code is a required input.

27.3.4 Rate Dependency Selection Screen

Figure 210: Rate Dependency Selection



27.3.4.1 Rate Dependency Relationships

Rate dependency relationships utilized within ALM but are not supported in BSP. For BSP, you must select No Relationship.

- No Relationship
- Rate Level Dependent
- Rate Spread Dependent

- Economic Indicator Dependent

27.3.4.2 Rate Dependency Patterns

If one of the Rate Dependency options, other than No Relationship, is selected, the Rate Dependency Pattern drop list becomes active. The list of available patterns is limited to those which apply to the selected Rate Dependency Relationship type.

27.3.5 The Pricing Margin Details screen

In an income simulation scenario, you may want to price new business for an account at a margin above or below a market interest rate code. For example, you can model a premium paid on CDs in relation to a market yield curve by adding a pricing margin to the interest rate code assigned to the product in the Product Characteristics rule. If you want a rate that is 25 bps above the market yield curve, you will type “0.25" as the pricing margin for the appropriate modeling period.

The Pricing Margin rule uses the modeling period defined in the “active” Time Bucket rule. You should always verify that your modeling horizon and related assumptions are consistent with the As of Date and active Time Bucket rule before processing.

27.3.5.1 Rate Tiers

Rate Tiers reflect the Rate Dependency Pattern details from the selected Rate Dependency Pattern. You define Pricing Margin assumptions for each rate tier. The application will automatically determine which set of assumptions to apply for a given scenario based on the relationship between the Rate Tier and the related Forecast Rate assumption value.

27.3.5.2 Margin Type

This option allows you to enter the Margin as Rate (fixed rate) or Percent (percentage of forecast Rate). By default, it is set to Rate.

- If Margin Type is selected as Rate, provided Margin is used as a fixed spread.
- If Margin Type is selected as Percent, Margin needs to be provided as Percentage of forecast rate. If the margin is 10% of the forecast rate, 10 needs to be provided. Margin is calculated as:

  Margin = Margin % * Raw Rate

For more information, see the Cash Flow Reference Guide on OTN.

Once you change from Rate to Percent, all unsaved margin data will be deleted.

A warning message is displayed: *All entered values will be lost. Do you want to proceed?*

27.3.5.3 Bucket Number

The bucket number input allows you to select a range of buckets over which the pricing margin assumption will apply. Start Date and End Date values are updated automatically based on the Bucket Number input for each row.

27.3.5.4 Start Date and End Date

When the Pricing Margins detail page opens, the Start Date (min value) and End Date (max value) columns are automatically populated and are read-only values. The date ranges represent the Income Simulation Date buckets as defined in the "active" Time Bucket rule. See Time Buckets for more information. Any new business that originated within these dates is modeled using the pricing margins defined in the Pricing Margin rule. The new business added for each date bucket will have the same net and gross margin for its life. The margins for a particular instrument will not change as the instrument ages.

27.3.5.5 Gross Margin

The Gross Margin you define is added to the Interest Rate Code specified in the Product Characteristics rule to define the gross rate on new business.

> **NOTE** BSP supports only Net Margins.

27.3.5.6 Net Margin

The Net Rate is affected by setting the Net Margin Flag in the Product Characteristics rule. If Net Margin Flag is set to Floating Net Rate, then Net Rate is equal to the Interest Rate Code plus Net Margin.

If the Net Margin Flag is set to Fixed Net Rate, then Net Rate is equal to Net Margin.

> **NOTE** If Margin Type is selected as Percent and Net Margin Flag is set to Fixed Net Rate, provided Margin as Percent is treated as Rate.

Apply Defined Buckets to all Rate Tiers

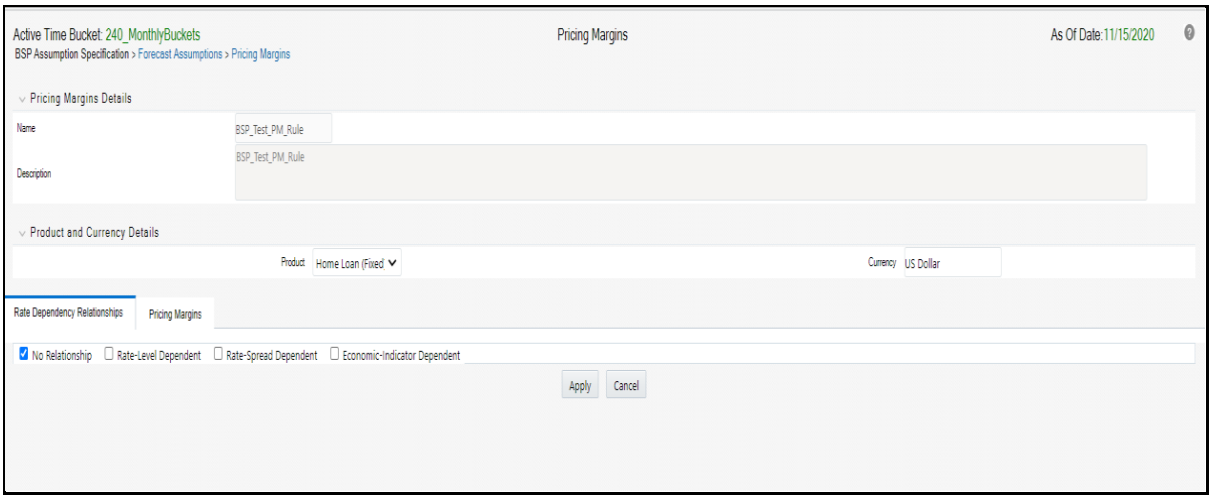
This option allows you to copy the bucket setup from one page to all other Rate Tiers when using Rate Dependent assumptions.

27.4 Defining a Pricing Margin Rule: An Example

Define a Pricing Margin Rule using a Rate Dependency Pattern.

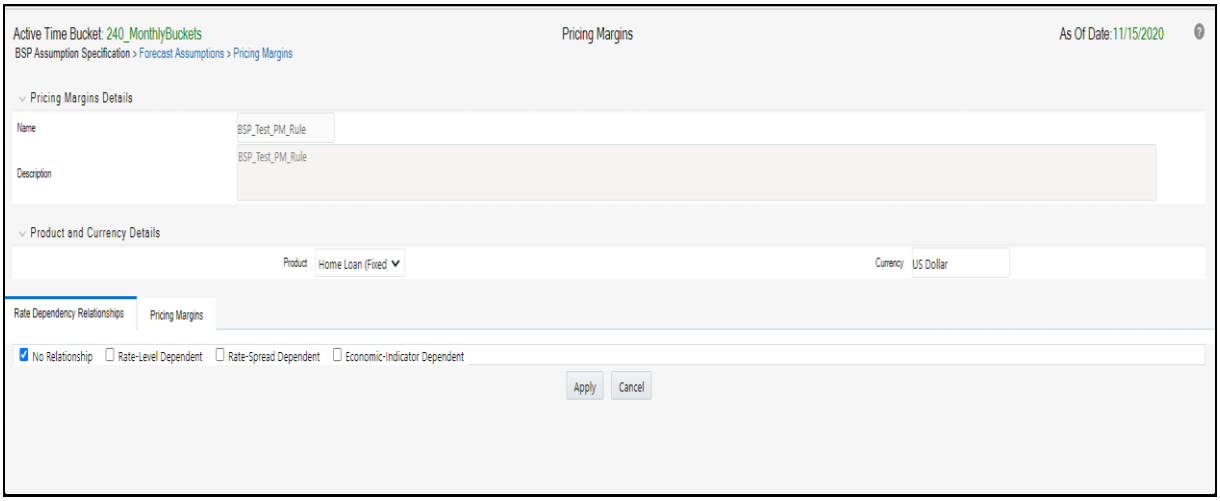
1. From the Assumption Browser, select Currency (US Dollar) and a product from the hierarchy browser.

Figure 211: Pricing Margin Rule – An Example



2. Select the "Add New" icon to enter the Assumption Details page.
3. Select the Rate Level Dependent – Rate Dependency option.

Figure 212: Rate Dependency Option Selection



4. Select the Rate Level – Rate Dependency Pattern from the drop list.
5. Select Apply to navigate to the Pricing Margin Tab where you can define assumptions for each rate tier.
6. Add bucket ranges to the page as needed. Optionally, select the "Apply Defined Buckets to All Rate Tiers" check box to copy the bucket structure across all rate tier pages.
7. Input Rate Spreads for each bucket range that you define.

> **NOTE** You may want to utilize the Data Input Helper to copy an assumption from a row where you have already defined a value or apply a fixed amount down the page. The following optional steps describe how to use this feature.

   a. Select the check boxes next to the rows that you want to work with or use the "Select ALL" option by selecting the check box on the header row.

b. Select the Data Input Helper icon.

c. From the Data Input Helper – popup screen, select Method – "Keep Current Values" or some other appropriate method.

d. Select the Frequency and/or Multiplier from the left side of the shuttle box.

e. Select APPLY to copy assumptions to the selected rows.

8. You can also use the Excel import/export feature to add the Date Buckets/Margins information in the Pricing Margins tab.

9. Select Apply to commit your assumptions for each Rate Tier. Repeat the process for each rate tier. After you have defined assumptions for all Rate Tiers, you will return automatically to the Assumption Browser page.

> **NOTE** You can select more than one product at a time from the Assumption Browser page.

When Pricing Margin assumptions are defined for all required product/currency combinations, select SAVE from the Assumption Browser page.

28 Forecast – Maturity Mix

This module describes the procedure for working with and managing Maturity Mix rules.

This chapter covers the following topics:

28.1 Overview of Maturity Mix Rules

Maturity Mix rules allow you to define the term distribution of new business added during each forecast period. Maturity Mix assumptions are set at the product and currency levels. For new volumes generated during a simulation run, you will define the maturity and amortization terms applied to the balances originated in each period, as well as specify a maturity distribution for the volumes originated. For example, mortgage originations may be divided into 25% - 5 Year Term / 30 Year Amortization, 25% - 7 Year Term / 30 Year Amortization, and 50% - 30 Year Term / 30 Year Amortization. You attach the set of maturity assumptions to apply to all new volumes within a Dynamic BSP Process by selecting the appropriate Maturity Mix rule.

In BSP, all new business processing occurs within BSP's planning user interfaces. BSP does not directly support Dynamic Deterministic processes. When you process a new business forecast in BSP's planning user interfaces, you operate within the context of a specific Forecast Set. For BSP, Maturity Mix rules are part of the definition of each Forecast Set.

New business assumptions are defined based on the combined inputs from the following 4 forecast related business rules:

- Product Characteristics
- Forecast - Pricing Margins
- Forecast – Maturity Mix

The procedure for working with and managing Maturity Mix rules is similar to that of other Oracle Balance Sheet Planning business rules. It includes the following steps:

- Searching for Maturity Mix rules. For more information, see the Searching for Rules section.
- Creating Maturity Mix Rules. For more information, see Creating Rules section.
- Viewing and Editing Maturity Mix rules. For more information, see the Viewing and Editing Rules section.
- Copying Maturity Mix rules. For more information, see the Copying Rules section.
- Deleting Maturity Mix rules. For more information, see Deleting Rules section.

As part of creating and editing Maturity Mix rules, you define Maturity Mix assumptions for applicable products. See: Defining Maturity Mix Rules

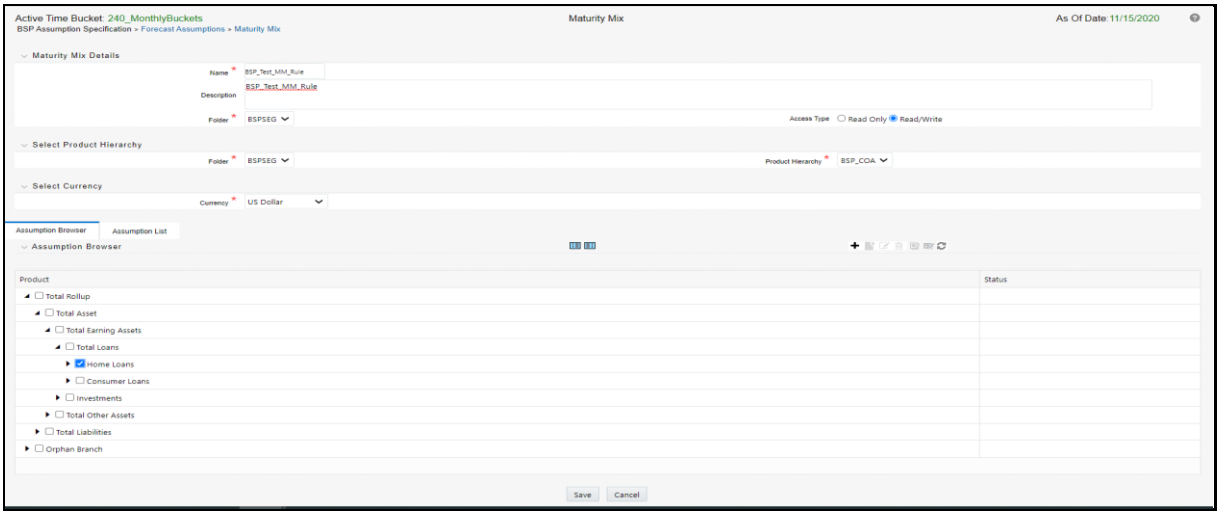
28.2 Creating Maturity Mix Rules

You create Maturity Mix rules to define the maturity and amortization term for new business volumes. Maturity Mix rules use the modeling period defined in the active Time Bucket rule to establish the date range over which these assumptions can be defined.

Procedure

1. Navigate to the Maturity Mix Rule summary page.
2. Complete standard steps for this procedure.

Figure 213: Forecast Maturity Summary Screen



NOTE In addition to the standard steps for creating rules, the procedure for creating a Maturity Mix rule involves one extra step. After Standard Step 6, you need to select a product hierarchy. You can define methodologies at any level of the hierarchical product dimension. The hierarchical relationship between nodes allows the inheritance of methodologies from parent nodes to child nodes.

Oracle Balance Sheet Planning provides you with the option to copy, in total or selectively, the product assumptions contained within BSP business rules from one currency to another currency or a set of currencies or from one product to another product or a set of products.

28.3 Defining Maturity Mix Rules

The definition of a Maturity Mix rule is part of the Create or Edit Maturity Mix rule process. When you click Save in the Create Maturity Mix rule process, the rule is saved and the Maturity Mix rule summary page is displayed. However, Maturity Mix assumptions have not yet been defined for any of your products at this point. Typically, you would start defining your Maturity Mix assumptions for product-currency combinations before clicking Save.

Defining Maturity Mix Using Node Level Assumptions

Node Level Assumptions allow you to define assumptions at any level of the Product dimension Hierarchy. The Product dimension supports a hierarchical representation of your chart of accounts, so you can take advantage of the parent-child relationships defined for the various nodes of your product hierarchies while defining rules. Children of parent nodes on a hierarchy automatically inherit the assumptions defined for the parent nodes. However, assumptions directly defined for a child take precedence over those at the parent level.

28.3.1.1 Prerequisites

Performing basic steps for creating or editing a Maturity Mix rule

28.3.1.2 Procedure

Defining Maturity Mix assumptions involves three primary steps:

1. Choosing your rate dependency option
2. Defining Maturity Mix assumption bucket ranges
3. Inputting Maturity Mix assumption details

> **NOTE** Using the default currency to set up assumptions can save data input time. At run time, the calculation engine uses assumptions explicitly defined for a product currency combination. If assumptions are not defined for a currency, the engine uses the assumptions defined for the product and the default currency. If the assumptions are the same across some or all currencies for a specific product, you can input assumptions for the default currency. Be careful using this option on screens where an Interest Rate Code is a required input.

Rate Dependency Relationships

There are four rate dependency options to choose from:

- No Relationship
- Rate Level Dependent
- Rate Spread Dependent
- Economic Indicator Dependent

28.3.1.3 Rate Dependency Patterns

If any one of the Rate Dependency options, other than No Relationship, is selected, the Rate Dependency Pattern drop list becomes active. The list of available patterns is limited to those which apply to the selected Rate Dependency Relationship type.

> **NOTE** Rate Dependency Patterns are not supported in BSP. For BSP, you must select No Relationship.

28.3.1.4 Maturity Mix Date Bucket Selection Screen

Click the Add Row button to select the number of maturity mix date ranges that are required during the forecast period. The Bucket Number column is used to calculate the start and end dates. The Bucket Number column determines which income simulation bucket is used to calculate these dates.

The Maturity Mix rule uses the modeling period defined in the "active" Time Bucket rule. You should always verify that your modeling horizon and related assumptions are consistent with the As of Date and active Time Bucket rule before processing.

Rate Tiers: Rate Tiers reflect the Rate Dependency Pattern details from the selected Rate Dependency Pattern. You define Maturity Mix assumptions for each rate tier. The application will automatically determine which set of assumptions to apply for a given scenario based on the relationship between the Rate Tier and the related Forecast Rate assumption value.

Bucket Number: The bucket number input allows you to select a range of buckets over which the maturity mix assumptions will apply. Start Date and End Date values are updated automatically based on the Bucket Number input for each row.

Start Date and End Date: When the Maturity Mix detail page opens, the Start Date (min value) and End Date (max value) columns are automatically populated and are read-only values. The date ranges represent the Income Simulation Date buckets as defined in the "active" Time Bucket rule. SeeTime Buckets for more information. Any new business that originated within these dates is modeled using the Maturity Term(s) defined in the Maturity Mix rule.

> **NOTE** The Start Date value in the first row is always set equal to the first modeling date, that is the as of date plus 1 day, and the End Date value in the last row always equals the last day of the modeling horizon as defined in the "active" Time Bucket rule.

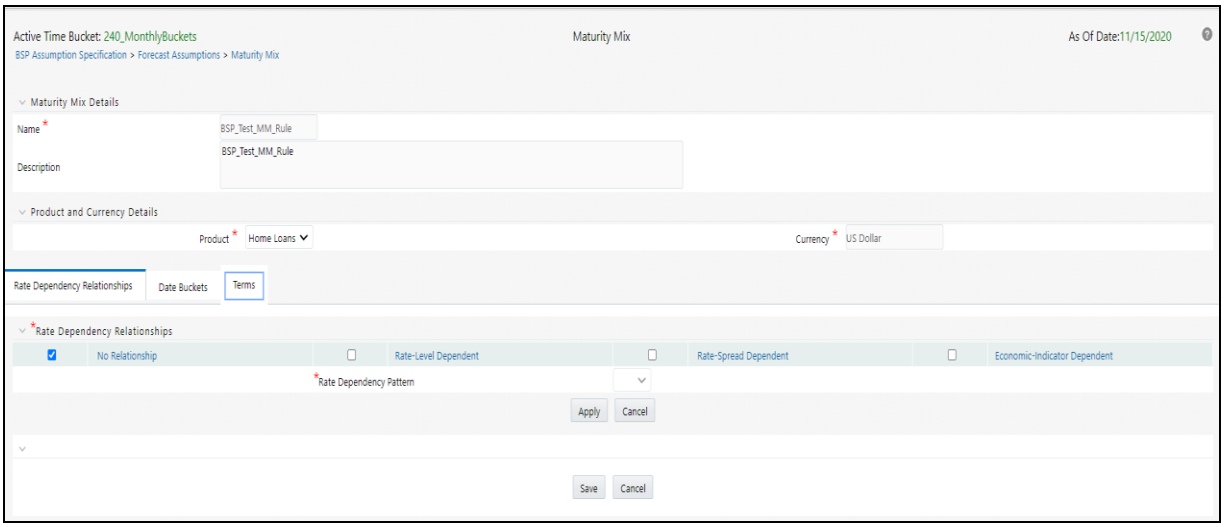
Apply Defined Buckets to all Rate Tiers

This option allows you to copy the bucket setup from one page to all other Rate Tiers when using Rate Dependent assumptions.

28.3.1.5 Maturity Mix Details Screen

The Maturity Mix details screen allows you to define the maturity mix details. You can assign one or more maturity terms within the details page, but the sum of the percentage weights must equal 100%.

Figure 214: Maturity Mix Details Screen



Maturity: Maturity (= term)

Multiplier: Maturity multiplier (= days, months, years)

Amortization: The amortization term will default to the maturity term. The amortization term should always be greater than or equal to the maturity term.

Multiplier: Amortization multiplier (= days, months, years)

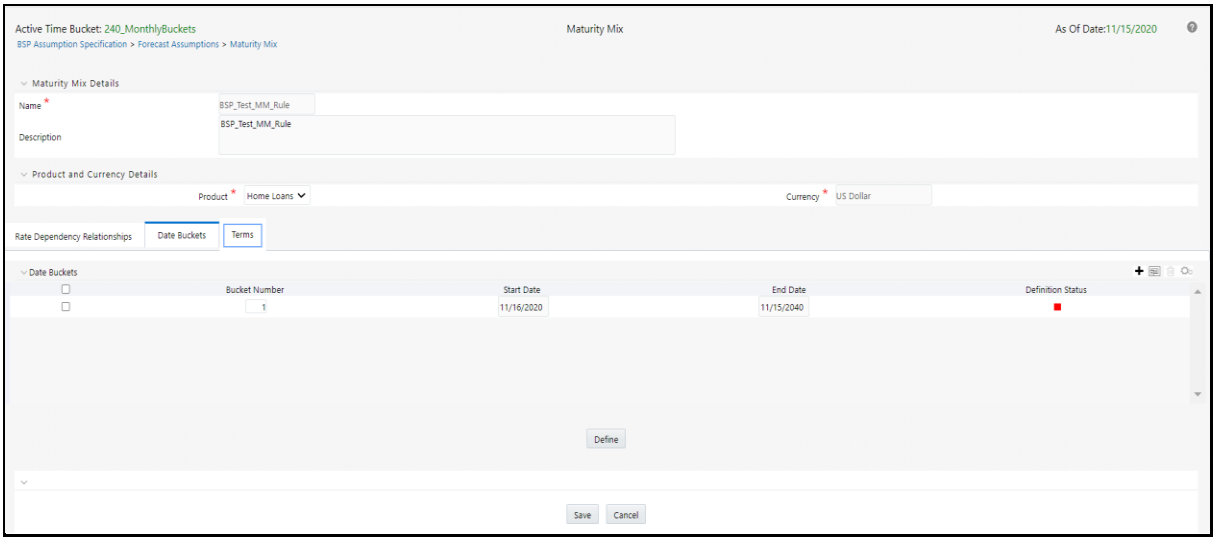
Percent: The percentage of new business at the specified term and maturity for the associated date bucket.

For each Date Bucket defined, the maturity terms must be specified.

28.3.1.6 Defining a Maturity Mix Rule: An Example

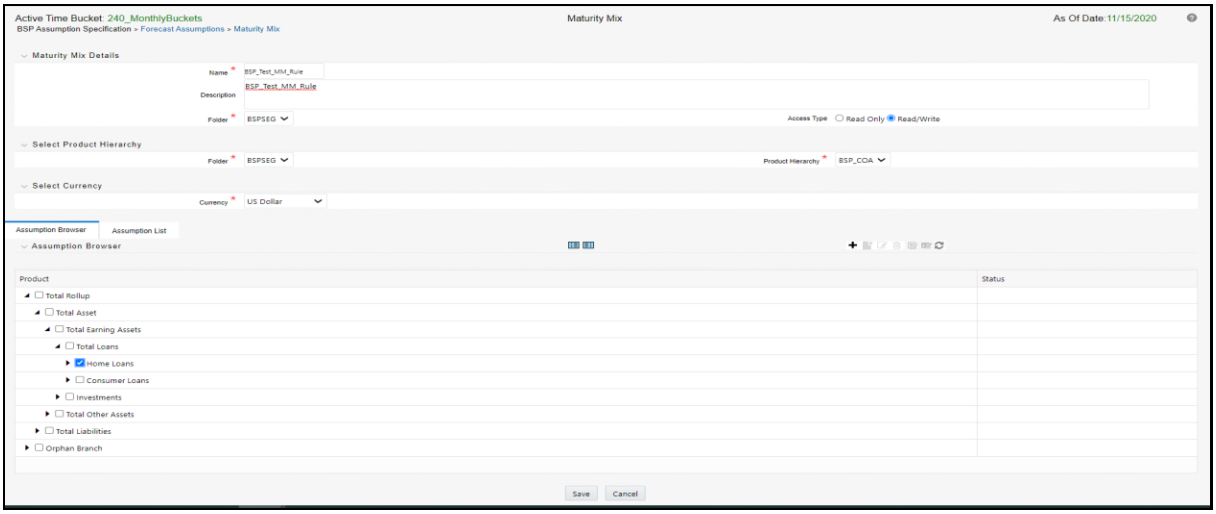
1. Define a Maturity Mix rule using a Rate Dependency Pattern.
2. From the Assumption Browser, select Currency (US Dollar) and a product from the hierarchy browser.

Figure 215: Creating Maturity Mix Rules



3. Select the "Add New" icon to enter the Assumption Details page.
4. Select the Rate Level Dependent – Rate Dependency option.

Figure 216: Creating Maturity Mix Rules – Rate Dependency



5. Select the Rate Level – Rate Dependency Pattern from the drop list.
6. Select Apply to navigate to the Date Buckets Tab.
7. Add bucket ranges to the page as needed. Optionally, select the "Apply Defined Buckets to All Rate Tiers" check box to copy the bucket structure across all rate tier pages.
8. Select the check box for the first bucket range and select "Define" to navigate to the Terms tab.
9. Add one or more rows based on the number of maturity terms needed for the selected product.
10. Input Maturity Terms, Amortization Terms, and Percentage Weights for each row and select Apply to save your inputs for the selected bucket range. Notice the status column on the Date Buckets tab turns from Red to Green, indicating that you have successfully defined assumptions for the bucket range.
11. Continue to define Maturity Mix assumptions for each Bucket Range.
12. You can also use the Excel import/export feature to add the maturity information in the Terms tab.
13. Select Apply to commit your assumptions for each Rate Tier. Repeat the process for each rate tier. After you have defined assumptions for all Rate Tiers, you will return automatically to the Assumption Browser page.

> **NOTE** You can select more than one product at a time from the Assumption Browser page.

14. When Maturity Mix assumptions are defined for all required product/currency combinations, select SAVE from the Assumption Browser page.

29 Transfer Pricing Rules

Transfer Pricing Rules allow you to specify methodologies for Transfer Pricing your product portfolio. A Transfer Pricing rule may contain a Transfer Pricing Methodology defined for a particular product or a set of methodologies defined for all products (Dimension Members) in a particular product hierarchy. In addition, it contains certain parameters used in defining option cost methodologies.

The Transfer Pricing rule is a key component of the Transfer Pricing Process. The Transfer Pricing Process uses the Transfer Pricing Methodologies contained in the Transfer Pricing Rules to generate Transfer Rates. Consequently, before processing information for a new period, you need to review and validate the assumptions contained in your Transfer Pricing Rules.

> **NOTE** If Transfer Pricing Assumptions are managed at the Parent / Node level, new product dimension members will automatically inherit TP Method assignments.

If new members are added to the applicable product dimension, you need to update your Transfer Pricing Rules by defining appropriate methodologies for the new products.

The procedure for working with and managing the Transfer Pricing Rule is similar to that of other Oracle Funds Transfer Pricing assumption rules. It includes the following steps:

- Searching for Transfer Pricing Rules
- Creating Transfer Pricing Rules
- Viewing and Editing Transfer Pricing Rules
- Copying Transfer Pricing Rules
- Deleting Transfer Pricing Rules

As part of creating and editing Transfer Pricing Rules, you can also define Transfer Pricing Methodologies. See:

- Defining Transfer Pricing Methodologies
- Defining the Redemption Curve Methodology
- Defining the Unpriced Account Methodology

Oracle Funds Transfer Pricing provides you with the option to copy, in total or selectively, the product assumptions contained within the Transfer Pricing, Prepayment, and Adjustments Rules from one currency to another currency or a set of currencies.

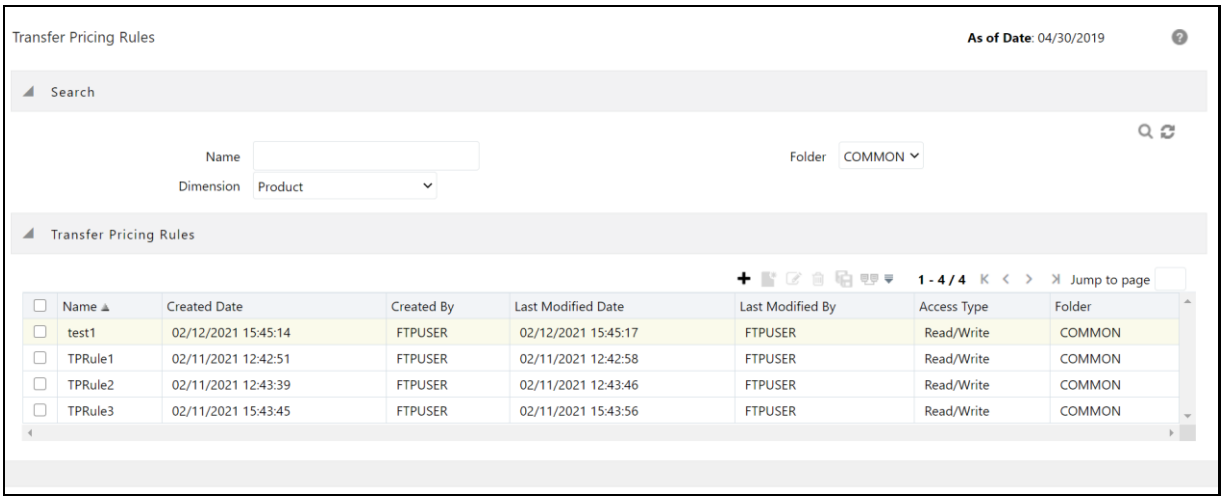
29.1 Creating Transfer Pricing Rules

You create a Transfer Pricing Rule to map Transfer Pricing Methodologies for your products.

To create a Transfer Pricing Rule, follow these steps:

1. From the LHS menu, select **Funds Transfer Pricing**, select **FTP Assumption Specification**, and then select **Transfer Pricing Rules**.

Figure 217: Transfer Pricing Rules Summary Screen



2. Complete standard steps for this procedure.

   In addition to the standard steps for creating rules, the procedure for creating a Transfer Pricing Rule involves one extra step. After Standard Step 5, you need to select a product hierarchy. You can define methodologies at any level of the hierarchical product dimension. The hierarchical relationship between the nodes allows the inheritance of methodologies from Parent nodes to Child nodes.

29.2 Defining Transfer Pricing Methodologies

The assignment of Transfer Pricing Methodologies is part of the Create or Edit Transfer Pricing Rules process where assumptions about Transfer Pricing Methodologies are made for product-currency combinations. When you click **Save** in the Create Transfer Pricing Rules process, the rule is saved and the Transfer Pricing Rule Summary Page is displayed. However, the Transfer Pricing Methodology has not yet been defined for any of your products at this point. You start defining your methodologies for the product-currency combinations before clicking **Save**.

The Transfer Pricing Rule supports the definition of assumptions for combinations of two dimensions: Product and Currency.

You can define Transfer Pricing Methodologies for your entire product portfolio one currency at a time. Suppose your portfolio is comprised of products denominated in two currencies (US Dollar and Japanese Yen) and that you want to specify different Transfer Pricing assumptions and/or different Transfer Pricing yield curves, for each product group. Using the currency selection drop-down list, you can first define assumptions for the products denominated in US Dollars and then proceed with defining assumptions for the Yen-based products.

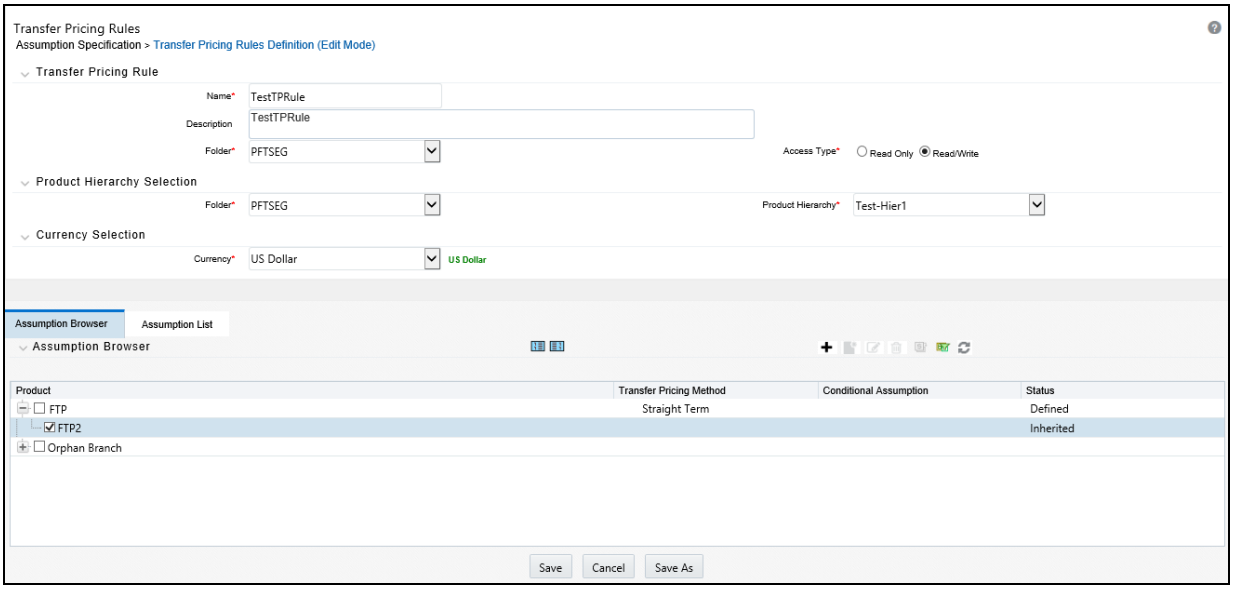
After you have created a Transfer Pricing rule, you can assign Transfer Pricing Methodologies to product-currency combinations in either of the following two ways:

- By creating a conditional assumption using conditional logic. For more information, see Associating Conditional Assumptions with Assumption Rules.
- Directly on the Transfer Pricing Methodology Page, as described here.

29.2.1 Defining Assumptions with the Default Currency

For cases where you have the same assumption (method and IRC) which is applicable to all currencies or multiple currencies, you can define rules for the combination of Product and *Default Currency*. To define assumptions for the Default Currency, select a Product from the Hierarchy and *Default Currency* from the currency list and proceed with the assumption definition. When processing data, the TP engine will first look for an assumption that exactly matches the product or currency of the instrument record. If not found, the engine will then look for the combination of the product and the Default Currency. This is a useful option to utilize during setup when the same product exists across multiple currencies and shares the same TP assumption and Interest Rate Code.

Figure 218: Transfer Pricing Rule Definition (Edit Mode)



Default Currency setup example: If you have two instrument records of the same product, each with a different currency, for example, 1 is 'USD' and the other is 'AUD', you have two configuration choices. You can either:

- Define the assumptions individually for each product-currency combination using direct input or copy across.
- You can create 1 assumption for the combination of Product and *Default Currency*. When you use *Default Currency*, the TP Engine will apply this assumption to ALL currencies (unless a direct assumption is available for the product + currency processed). In the case where users have many individual currencies that utilize the same TP Method and reference IRC rates, this is a useful option because you only have to define the assumption 1 time and it applies to many different Product + Currency combinations.

For defining assumptions with Default Currency, you must perform the basic steps for creating or updating Transfer Pricing Rules.

Procedure:

This table describes the key terms used for this procedure.

Figure 219: Fields in the Transfer Pricing Rule Definition Screen

Term	Description
Yield Curve Term	Defines the point on the yield curve that the system references to calculate Transfer Rates.
Historical Term	Specifies the period over which the average is to be taken for the Moving Averages method.
Lag Term	Specifies a yield curve from a date earlier than the Assignment Date for the Spread from Interest Rate Code method.
Rate Spread	The fixed positive or negative spread from an Interest Rate Code or Note Rate is used to generate transfer rates in the Spread from Interest Rate and Spread from Note Rate methods.
Model with Gross Rates	This option becomes available when you select Account tables as the data source and allows you to specify whether modeling should be done using the net or gross interest rate on the instrument. This option is only applicable when the Net Margin Code is also set to one, for example, Fixed. Gross rates are selected while modeling the effect of serviced portfolios where the underlying assets are sold but the organization continues to earn servicing revenue based on the original portfolio.
Mid Period	This option applies to Adjustable-Rate instruments only. It dictates whether the transfer rate is based on the Last Repricing Date, Current Repricing Period, Prior Repricing Date, or some combination thereof.
Audit Trail	Select to generate Audit Trail Output for specific product/ currency combination.
Assignment Date	This is the effective date of the yield curve.
Percentage/Term Points	The term points that the system uses to compute the Redemption Curve Method results. A percentage determines the weight assigned to each term point when generating results.
Add Dimension Values	Allows you to select the products that you want to use as source values when you transfer price using the Unpriced Account Method.
Across All Organization Units	When this option is enabled, the Transfer Price is calculated as a weighted average across all organization units for the matching product value and currency, and any optional migration dimensions selected in the Transfer Pricing Process Rule. Otherwise, the Transfer Price is calculated from accounts only within a particular Organizational Unit.
Holiday Calendar	Holiday Calendars are defined in the Holiday Calendars UI. In the Holiday Calendar, you can specify weekend days and Holiday Dates as applicable.
Rolling Convention	Rolling Conventions allow you to specify how dates falling on specified weekends or holidays should be handled.

Term	Description
Interest Calculation Logic	The Interest Calculation Logic Assumption allows you to specify whether to simply the date of the computed cash flow or to shift the date and recalculate the interest payment amount.

To define the assumptions with the default currency, do the following:

1. Navigate to the Assumption Browser Page.
2. Select a **Product Hierarchy**.
3. Select a **Currency**.
4. The list of currencies available for selection is managed within Rate Management and reflects the list of *Active* currencies.
5. Expand the hierarchy and select one or more members (leaf values and/or node values) from the product hierarchy.
6. Click the **Add** icon to begin mapping Transfer Pricing Methods to the list of selected product dimension members. The system displays a list of all the products (for which you can define assumptions) or currencies (that are active in the system).
7. From the TP Method Selector Page, select the appropriate data source: **Account Tables** or **Ledger Table**.
8. Select the Transfer Pricing Method for the selected product member.

> **TIP** The Transfer Pricing Methodologies available depend on the selected data source. See: Transfer Pricing Combinations.

   Depending on the Transfer Pricing Method selected, certain required and optional parameter fields are displayed. You can update these fields as required. See Required Parameters for a Transfer Pricing Methodology. See also:

   - Defining the Redemption Curve Methodology
   - Defining the Unpriced Account Methodology

9. Select **Output Audit Trail** to output the audit data at the time of processing
10. Specify the desired **Option Cost** Methodology. This option is available only when the data source is Account Tables. You can specify an Option Cost Methodology as follows:
    f. Select Run using Monte Carlo Option Cost Method. The Target Balance drop-down list is displayed.
    g. Select the required balance type. You can select any one of the following as the designated target balance for option cost calculations:
    — Par Balance
    — Book Balance

- Market Value (Note: the Market_Value_c column should be populated if you make this selection, either by an Oracle ALM process or via direct load from an external source).

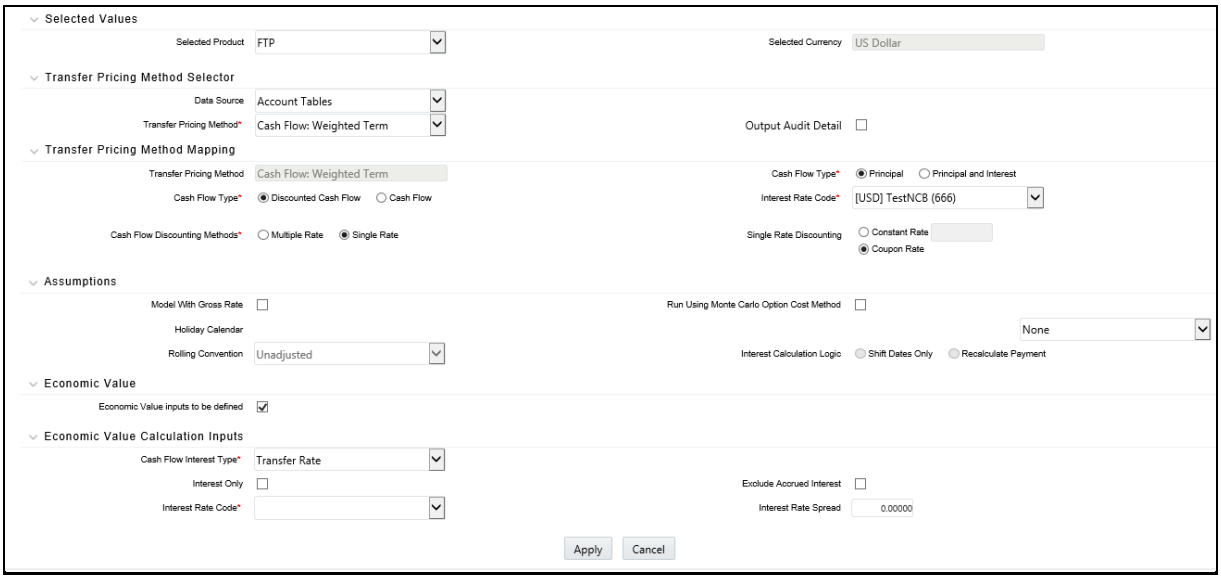
For more information on Transfer Pricing Option Cost, See OFS Cash Flow Engine Reference Guide and Stochastic Transfer Pricing Process and Option Cost Parameters.

11. Select the **Holiday Calendar**. The screen displays the Holiday Calendar inputs only for Cash Flow TP methods – Duration, Average Life, Weighted Term, Zero Discount Factors. The default assumption is *None*, meaning Holiday Calendar adjustments are turned off. If a Holiday Calendar is selected, Holiday Calendar adjustments will be enabled and the following two additional inputs will be required:

    - **Rolling Convention**
        - **Following Business Day**: The payment date is rolled to the next business day.
        - **Modified following Business Day**: The payment date is rolled to the next business day unless doing so would cause the payment to be in the next calendar month, in which case the payment date is rolled to the previous business day.
        - **Previous Business Day**: The payment date is rolled to the previous business day.
        - **Modified previous Business Day**: The payment date is rolled to the previous business day unless doing so would cause the payment to be in the previous calendar month, in which case the payment date is rolled to the next business day
    - **Interest Calculation Logic**
        - **Shift Dates Only**: If a future payment date (as computed by the Cash Flow Engine (CFE)) falls on a designated holiday (including weekends), the CFE will shift the payment date from the holiday as per the rolling convention. No changes will be made to the payment amount or accrual amount; this is simply shifting the date on which the cash flow will post. The subsequent payment dates resume according to the original schedule.
        - **Recalculate Payment**: This option includes the same Holiday Calendar definition as in the Shift Dates Only option, but it also takes one additional step to recalculate the interest payment amount (and interest accruals) based on the actual number of days in the (adjusted) payment period. The instrument records use the payment frequency (term and multiplier) and the Re-Price frequency (term and multiplier) in association with the Next/Last Payment Date and Next/Last Re-Pricing Date to determine when the cash flow will post. The CFE logic is enhanced to acknowledge holiday dates and re-compute the payment/interest amount given the change in days. In addition, the engine gets back on the scheduled track of payment events after a holiday event occurs in one (or many sequential) events.

> **NOTE** Holiday Calendar adjustments can also be applied to the Tractor TP Method. For this method, the Holiday Calendar assumptions are defined within the Behavior Pattern > Replicating Portfolio UI.

Figure 220: Transfer Pricing Rule Definition (Edit Mode)



12. Select **Economic Value**. This section displays the inputs required for calculating Economic Value. These assumptions are optional and the section appears only when the "Economic Value inputs to be defined" check box is selected.

    The following inputs are required for calculating Economic Value:

    - **Cash Flow Interest Type**: Select the interest rate to use for calculating the Interest Cash Flow. This interest amount, together with the principal amount will be discounted and used to arrive at the Economic Value of the instrument Record.
    - **Interest Only**: Select this option if you want to exclude the Principal Cash Flow from the Economic Value Calculation.
    - **Exclude Accrued Interest**: Select this option if you want to exclude accrued interest, (interest computed from last payment date to As-of-Date) from the Economic Value calculation. This will provide you with a clean price.
    - **Interest Rate Code**: Select the Interest Rate code to be used for discounting the cash flows.
    - **Interest Rate Spread**: Input any applicable spread to be added on top of the IRC rate.

13. Click **Apply**.

    At this point, you can:

    - Continue defining additional methodologies for other product-currency combinations contained in your selection set, by repeating the above procedure.
    - Complete the process by clicking Cancel or by answering NO to the confirmation alert after applying the assumptions for each Product or Currency combination in your selected set.

14. From the Assumption Browser Page, click **Save**.

    The new assumptions are saved and the Transfer Pricing Rule Selector Page is displayed.

NOTE Oracle Funds Transfer Pricing provides you with the option to copy, in total or selectively, the product assumptions contained within the Transfer Pricing, Prepayment, and Adjustment rules from one currency to another currency or a set of currencies. For more information, see Copying Assumptions Across Currencies.

29.2.1.1 Availability of Transfer Pricing Methodologies

The availability of Transfer Pricing Methodologies depends on the data source that you select: Account Table or Ledger Table. The following table describes the Transfer Pricing Methodologies available for each of these data sources and displays whether that methodology requires the selection of a Transfer Pricing Interest Rate Code.

NOTE The Interest Rate Code LOV is filtered by the selected Currency.

Figure 221: Transfer Pricing Combinations

Transfer Pricing Methodology	Data Source: Account Table	Data Source: Ledger Table	Interest Rate Code	Behavior Pattern	Holiday Calendar
Do Not Calculate	Yes	Yes			
Cash Flow: Average Life	Yes		Yes		Yes
Cash Flow: Duration	Yes		Yes		Yes
Cash Flow: Weighted Term	Yes		Yes		Yes
Cash Flow: Zero Discount Factors	Yes		Yes		Yes
Moving Averages	Yes	Yes	Yes		
Straight Term	Yes		Yes		
Spread from Interest Rate Code	Yes	Yes	Yes		
Spread from Note Rate	Yes				
Redemption Curve	Yes	Yes	Yes		
Tractor Method	Yes	Yes	Yes	Yes	Yes
Caterpillar	Yes	Yes	Yes	Yes	
Weighted Average Perpetual	Yes	Yes	Yes	Yes	

Transfer Pricing Methodology	Data Source: Account Table	Data Source: Ledger Table	Interest Rate Code	Behavior Pattern	Holiday Calendar
Unpriced Account		Yes			

NOTE Not specifying assumptions for a node is not the same as selecting the Do Not Calculate methodology. Child nodes for which no assumptions are specified automatically inherit the methodology of their closest parent node. Therefore, if neither a Child node nor its immediate Parent has a method assigned, the application searches up the nodes in the hierarchy until it finds a Parent node with a method assigned, and uses that method for the Child node. However, if no Parent node has a method assigned then the application triggers a processing error stating that no assumptions are assigned for the particular product/currency combination. However, if the Parent node has the method *Do Not Calculate* assigned to it then the Child node inherits *Do Not Calculate*, obviating the need for calculation and for a processing error.

29.2.1.2 Required Parameters

You cannot define a Transfer Pricing Methodology successfully unless you specify the required parameters. The following table displays the parameters associated with each Transfer Pricing Method and specifies whether they are required or optional. The optional parameter fields display default values. However, you may decide to change the values for the optional parameters for certain methodologies, such as the Redemption Curve or the Unpriced Account Methods.

Figure 222: Required Parameters for a Transfer Pricing Methodology

Transfer Price Method	Yield Curve Term	Historical Range	Lag Term	Rate Spread	Assignment Date	Mid Period	Term Points	Dimension Values
Cash Flow: Average Life								
Cash Flow: Weighted Term								
Cash Flow: Duration								
Cash Flow: Zero Discount Factors								
Moving Averages	Required	Required						
Straight Term						Optional		
Tractor Method								

Transfer Price Method	Yield Curve Term	Historical Range	Lag Term	Rate Spread	Assignment Date	Mid Period	Term Points	Dimension Values
Spread from IRC	Required		Required	Required	Required	Optional		
Spread from Note Rate				Required		Optional		
Redemption Curve					Required	Optional	Required	
Caterpillar								
Do not Calculate								
Weighted Average Perpetual								
Unpriced Account								Required
Tractor Method								

29.3 Defining the Redemption Curve Methodology

As part of the process for defining the Redemption Curve Methodology, you must select as many Term Points from your selected Transfer Pricing Yield curve as are needed and allocate the percentage weighting for each of those points. The prerequisite for defining the Redemption Curve Methodology is performing basic steps for creating or updating a Transfer Pricing Rule.

To add the term steps, do the following:

1. Click **Add New Term Points** to display the Add New Term Points Page.
2. Select the **Transfer Pricing Yield Curve Points** as required.
3. Click **OK**.

   The Term Point Selection section is displayed.
4. Update the percentage value for each Term Point.

> **NOTE** The sum of all the percentages for all Term Points must add up to 100.

5. To remove a Yield Curve Point from the Percentages/Term Points table, select the term point(s) and click the **Delete** icon.

29.3.1 Defining Tractor Methodology

The prerequisites for defining a tractor methodology are:

- Creating a Non-Maturity Behavior Pattern with the Replicating Portfolio option enabled.

- Generating (and maintaining) the Portfolio. Volatile and Core Instrument strips will be created in the FSI_M_REP_PORTFOLIO_STRIPS table.

To define and use a tractor TP method:

1. Define the Transfer Pricing Rule and select the Tractor Method from the list of available TP Methods for relevant Product dimension members.
2. Select the appropriate Behavior Pattern.
   Note: The list will be limited to only those Behavior Patterns that are defined as Replicating Portfolios.
3. Select the Transfer Pricing Interest Rate Code.
4. Define a Transfer Pricing Process and Run using the TP Rule.
   - TP Process transfers price the non-zero portfolio strips using a straight term method.
   - TP Process computes a weighted average TP rate for the portfolio and will update all instruments mapped through the TP rule to this method.

29.3.2 Defining the Unpriced Account Methodology

When defining an Unpriced Account Methodology, you need to select the Product dimension members (products) whose weighted average transfer rate will be assigned to the product or currency combination being defined. The prerequisite for defining the Unpriced Account Methodology is performing basic steps for creating or upgrading a Transfer Pricing Rule.

To add the dimension values, do the following:

1. Click the **Dimensional Values** icon to display the Hierarchical Add Members Page.
2. Search and select the required dimension members. Specify whether the weighted average of Transfer Rates has to be taken across all organizational units or for accounts only within that organizational unit.

> **NOTE** You must also select the Organization Unit dimension along with any other applicable dimensions under Migration Dimensions on the Migration tab of the TP Process when using this method.

3. Click **Apply**.

   The Transfer Pricing Assumption Browser Page is displayed.

29.4 Copying Assumptions across Currencies

This functionality provides you with the option to copy, in total or selectively, the product assumptions contained within the Transfer Pricing, Prepayment, and Adjustment Rules from one currency to another currency or a set of currencies.

Copy of assumptions across currencies enhances the usability of Oracle Funds Transfer Pricing in a multi-currency environment. For example, if you have 10 currencies enabled in the application, you

need to input only one set of assumptions and then copy those assumptions across all enabled currencies, instead of having to input 10 full sets, thereby saving a significant amount of input time.

This functionality also reduces the risk associated with data input errors, as you need to audit inputs for a single set of assumptions before executing the copy procedure. The copy across the currencies process requires users to select a replacement Transfer Pricing yield curve for each target currency. These currency-specific IRC's replace the IRC selection made for each product in the source currency selection set.

You must define Transfer Pricing, Prepayment, and (or) Adjustment Rules related to product assumptions.

To copy the assumptions across currencies, do the following:

1. Navigate to the appropriate (Transfer Pricing, Prepayment, or Adjustment rule) Assumption Browser.
2. Select **Source currency**.
3. Select defined product assumptions individually using the check boxes corresponding to each product (or Node on the hierarchy).
4. Click the **Copy Across Currencies** icon.
5. On the **Copy Across Currencies** Page, select the listed currencies either individually using the corresponding check boxes or in total using **Select All**.
6. Specify an interest rate code for each selected currency. This is necessary because each interest rate code is specific to a single currency. When copying product assumptions across currencies, you must define the interest rate code for each target currency to replace the interest rate code used for the source currency assumptions. For Transfer Pricing Rules that use the Redemption Curve Method, users should pay careful attention to the structure of the Interest Rate Codes selected for the Target currencies to ensure they contain all of the Term Points used in the definition of the source assumptions. If the selected target Interest Rate Code structures are missing required Term Points, the UI will display a notification regarding the missing Term Points, and assumptions cannot be copied until the user takes corrective action.
7. Click **Apply** to initiate the copy process and to return to the Assumption Browser Page.

> **NOTE** You can review the results of the copy process from the Assumption Browser by selecting a different currency and following the usual navigation to view or edit assumptions. The application displays new assumptions for each product that was included in the original source selection. The copy process replaces pre-existing assumptions for any product-currency combination that is included in the target selection.

8. Click **Save** on the Assumption Browser Page to save the assumptions to the database.

30 Adjustment Rules

Adjustment rules allow you to specify methodologies to calculate Transfer Pricing add-on rates for the relevant forecast balances in your portfolio. The methodologies contained in the Adjustments rule are referenced by the Static and Dynamic Deterministic BSP Processes.

> **NOTE** Adjustment Rule assumptions are used to assign TP Add-on rates to future balances only within BSP and are assumed to be constant for the life of the record from origination. Therefore the specific rules are not referenced in a Static Deterministic process. To assign adjustment rates to your instrument table data, Oracle Funds Transfer Pricing is required.

The procedure for working with and managing Adjustment rules is similar to that of other Oracle Balance Sheet Planning business rules. It includes the following steps:

- Searching for Adjustment rules. For more information, see the Searching for Rules section.
- Creating Adjustment Rules. For more information, see the Creating Rules section.
- Viewing and Editing Adjustment rules. For more information, see the Viewing and Editing Rules section.
- Copying Adjustment rules. For more information, see the Copying Rules section.
- Deleting Adjustment rules. For more information, see Deleting Rules section.

As part of creating and editing Adjustment rules, you define adjustment methodologies for applicable products. See the following sections for more information:

- Defining Adjustment Methods
- Availability of Adjustment Methods
- Adjustment Method Parameters
- Procedure to Define the Formula Based Rate Adjustment Method

Oracle Balance Sheet Planning provides you with the option to copy, in total or selectively, the product assumptions contained within the Adjustments, Transfer Pricing, and Prepayment rules from one currency to another currency or a set of currencies or from one product to another product or a set of products.

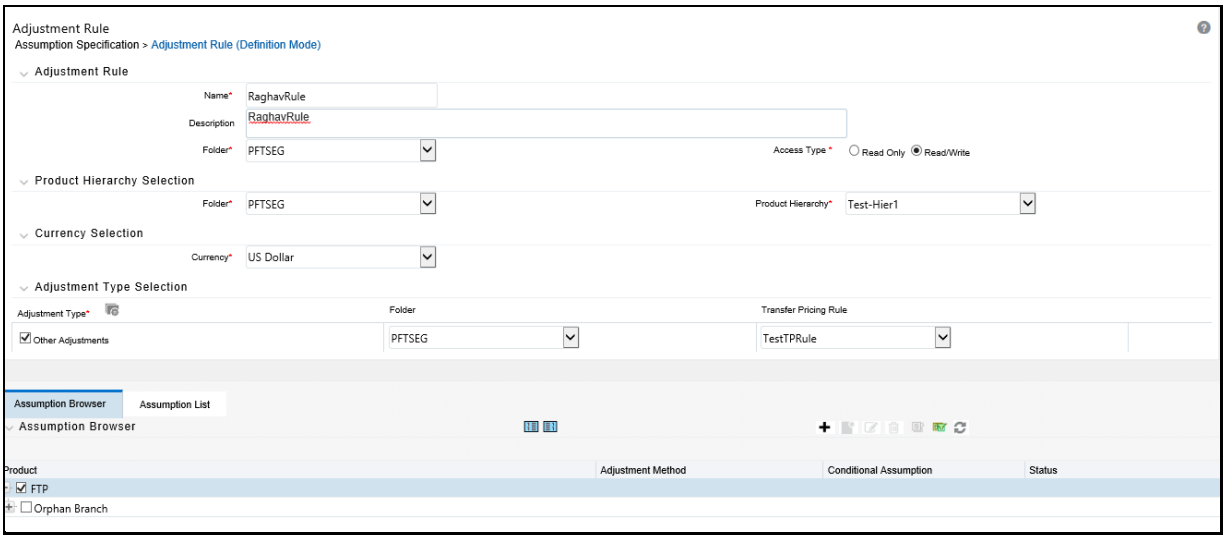
30.1 Creating Adjustment Rules

You create an Adjustment rule to define adjustment methodologies for your products.

Procedure

1. Navigate to the Adjustments rule summary page.
2. Complete standard steps for this procedure.

Figure 223: Adjustment Rule - Definition Mode



NOTE In addition to the standard steps for creating rules, the procedure for creating an Adjustments rule involves one extra step. After Standard Step 5, you need to select a product hierarchy. You can define methodologies at any level of the hierarchical product dimension. The hierarchical relationship between the nodes allows the inheritance of methodologies from parent nodes to child nodes.

30.2 Defining Adjustment Methods

The definition of adjustment methods is part of the Create or Edit Adjustments rule process. When you click Save in the Create Adjustments rule process, the rule is saved and the Adjustments rule summary page is displayed. However, adjustment assumptions have not yet been defined for any of your products at this point. Typically, you would start defining your adjustment assumptions for product-currency combinations before clicking **Save**.

Prerequisites

Performing basic steps for creating or editing an Adjustments rule

Procedure

This table describes key terms used for this procedure.

Table 37: Fields and Descriptions from the Adjustment Specification screen

Term	Definition
Reference Term	The associated term used for the add-on rate assignment. You can select one of the following types of reference terms: Original Term (the contractual term to the maturity of the account), Repricing Frequency (the frequency at which the account reprices), and Remaining Term (the number of months until the account matures).

Term	Definition
Lookup Method	Method used to derive an add-on rate for different reference term values. Specify Range as the lookup method if you want the application to apply the rates defined in the Adjustments rule to a range of reference term values, using the terms defined in the rule to specify the lower end of the range. Note that for values less than the lowest term point, the application uses the value associated with the lowest point. Specify Interpolation as the lookup method if you want the application to interpolate add-on rate values for applicable reference terms falling between node points specified in the Adjustments rule, using straight-line interpolation between the term points.
Term	In conjunction with the Multiplier, this field allows you to specify the value for the Reference Term, for a given lookup tier.
Multiplier	The unit of time applied to the Term. The choices are Days, Months, Years.
Rate	The add-on rate to be applied to instruments where Reference Term is the product of the Term and Multiplier defined for the row. The rate should be in percentage form, for example, 1.25 percent should be input as 1.25.
Assignment Date	For BSP, the usage of TP Adjustment Rates is limited to assigning rates to new originations only. So, the Origination Date is selected by default.
Interest Rate Code	Used for the rate lookup for the Formula Based Rate.
Formula	The mathematical formula used in the Formula Based Rate adjustment method to determine the Add-on rate: (Term Point Rate * Coefficient) + Rate Spread
Term Point	In conjunction with the Multiplier (day, month, or year), it is used in the Formula Based Rate method when looking up the rate for the designated Interest Rate Code.
Coefficient	Coefficient by which the Term Point rate should be multiplied.
Rate Spread	The spread added to the interest rate read from the selected Interest Rate Code. Rate Spread is used in the Formula Based Rate adjustment method. For the Formula Based Rate method, the spread is added to the result of the Term Point Rate * Coefficient. Enter the Rate Spread in percentage form, for example, 1.25 percent should be input as 1.25.

30.2.1 Availability of Adjustment Methods

The list of adjustment methods depends on the adjustment type that you select: add-on rates (including Liquidity Adjustments, Basis Risk costs, Pricing Incentives, and Other adjustments). The following table describes the adjustment methods available for each of the adjustment types.

Figure 224: Adjustment Rule Definition - Adjustment Rule Details

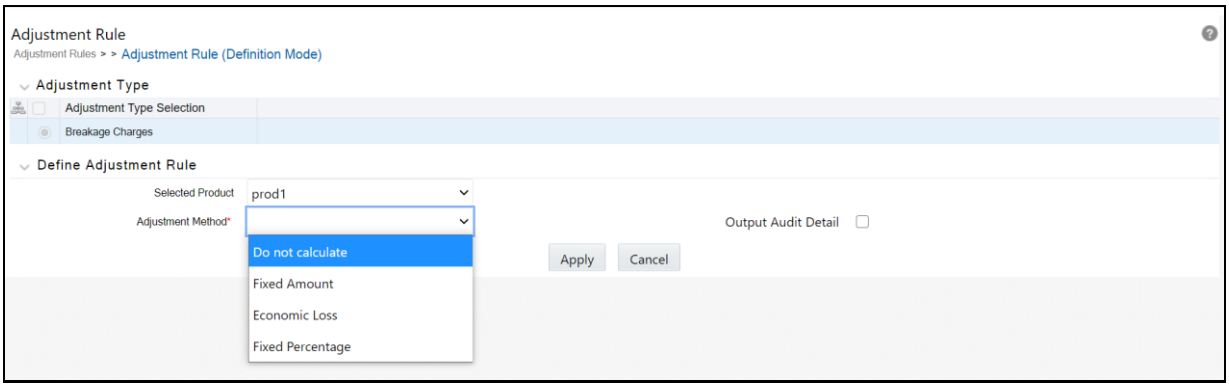


Table 38: Availability of Adjustment Methods

Adjustment Method	Adjustment Type: Add-On Rates (Liquidity Adjustments, Basis Risk Costs, Pricing Incentives, and Other Adjustments)
Do Not Calculate	Yes
Fixed Rate	Yes
Formula Based Rate	Yes

NOTE If you select "Do not calculate" as the calculation method, no adjustment assumptions will be assigned to the particular product-currency combination. This is a particularly useful option when using node-level assumptions because it allows you to exclude a particular child from inheriting a parent assumption.

30.2.2 Adjustment Method Parameters

To define an adjustment calculation method, you must specify one or more parameters, depending on the method. The parameter fields may display a default value, which you can override.

The following tables display the parameters associated with the adjustment methods for different adjustment types.

Table 39: Parameters Applicable to the Adjustment Methods for the Add-On Rate Adjustment Types

Adjustment Method	Reference Term	Lookup Method	Term	Multiplier	Rate	Assignment Date	IRC	Formula
Do Not Calculate								
Fixed Rate	Yes	Yes	Yes	Yes	Yes			
Formula Based Rate	Yes	Yes	Yes	Yes		Yes	Yes	Yes

> **NOTE** The Add-On Rate adjustment types include Liquidity Adjustments, Basis Risk Costs, Pricing Incentives, and Other Adjustments.

30.2.2.1 Prerequisites

Performing basic steps for creating or editing an Adjustments rule

30.2.2.2 Procedure

Once you have created an Adjustments rule, you can assign adjustment methodologies to product-currency combinations in either of the following two ways:

1. By creating a conditional assumption using conditional logic. See:
   - Associating Conditional Assumptions with Prepayment Rules
   - Defining Prepayments Using Node Level Assumptions
2. Directly on the Adjustment methodology page, as described here.

Use the following procedure to define an adjustment method:

3. Navigate to the Adjustments assumption browser page.
4. Select an appropriate adjustment type: Liquidity Adjustment, Basis Risk Cost, Pricing Incentive, or, Other Adjustment by opening the Adjustment Type selector window. You can enable one or more adjustment types within a single Adjustment Rule and apply more than one Adjustment to a single product.

> **NOTE** The product hierarchy refreshes when you change your Adjustment Type selection, but note that all selections made within the rule are saved. For example, when Liquidity Adjustment is selected, the hierarchy displays the status of Liquidity Adjustment mappings within the hierarchy. If you change your Adjustment Type selection to Basis Risk Cost, the hierarchy will refresh and you will see the status of all Basis Risk Cost mappings, and so on.

5. Select a Product Hierarchy.
6. Specify a currency.
7. Based on the selected hierarchy, the application displays a list of all the products (for which you can define assumptions).
8. Select the check box of one or more products for which you want to define adjustment details.
9. Select an adjustment method and enter the appropriate parameters.

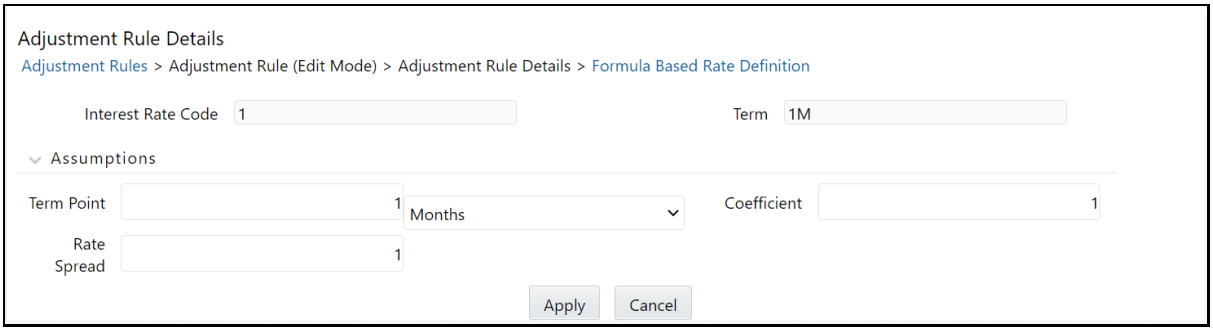
> **NOTE** The adjustment methods available depend on the selected adjustment type. Depending on the adjustment type and method adjustment combinations selected, certain required and optional parameter fields are displayed. You can update these fields as required. See:

- Adjustment Method Parameters
- Procedure to Define the Formula Based Rate Adjustment Method

10. Click Apply. If only one product was selected, the assumption browser page is displayed. If more than one product was selected on the assumption browser page, then each subsequent product in the select list will appear in the Selected Product drop list and each item should be defined appropriately. After completing the assumption details for each selected product, the assumption browser page will be displayed. At this point you can:
    - Continue defining assumptions for additional product-currency combinations for the selected Adjustment Type, by repeating the above procedure
    - Select a new Adjustment Type and continue defining assumption details for the required set of products
    - Complete the process by clicking Save. The new assumptions are saved and the Adjustments rule summary page is displayed.

> **NOTE** Oracle Balance Sheet Planning provides you with the option to copy, in total or selectively, the product assumptions contained within the Adjustments, Transfer Pricing, and Prepayment rules from one currency to another currency or a set of currencies or from one product to another product or a set of products.

30.2.3 Procedure to Define the Formula Based Rate Adjustment Method

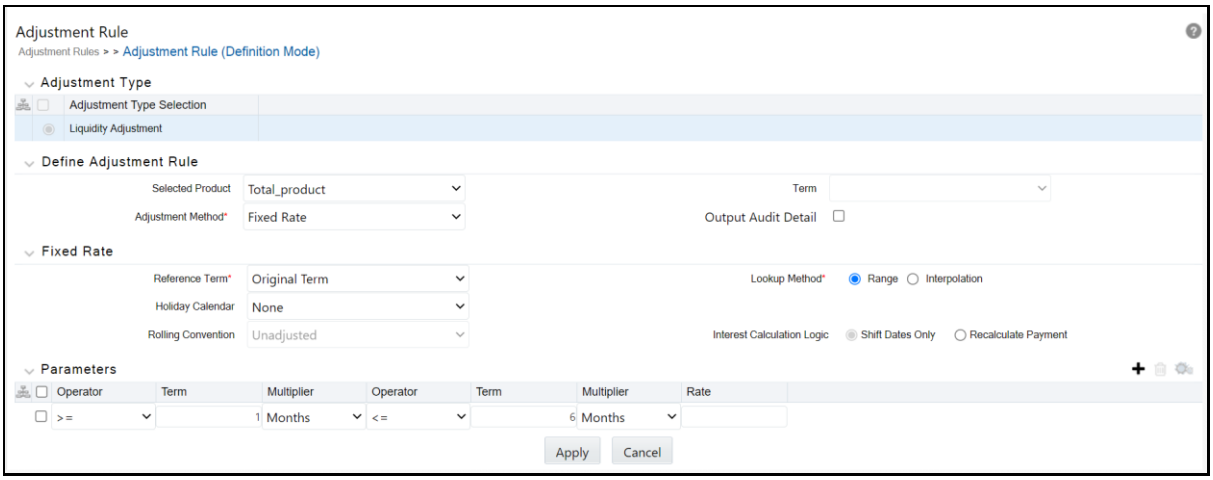


Defining the Formula Based Rate adjustment method involves the following additional steps:

1. Select Update to define the mathematical formula. The Define Formula for Reference Term page is displayed.
2. Specify the Term Point, Coefficient, and Rate Spread parameters on the Define Formula for Reference Term page.

30.2.4 Procedure to Define the Fixed Rate Adjustment Method

Figure 225: Fixed Rate Adjustment Method



Defining the Fixed Rate adjustment method involves the following additional steps:

1. Select Update to define the mathematical formula. The Define Formula for Reference Term page is displayed.
2. Specify the Term Point, Coefficient, and Rate Spread parameters on the Define Formula for Reference Term page.

31 BSP Processing

When all the required assumptions are defined, BSP Processing generates a result set for the current position forecast based on your account-level detail data. Once a BSP System Administrator has generated a current position result set, that data can be passed into any Forecast Set upon Initialization. For details on Forecast Sets and Initialization, see the BSP Planning Administrator and Planning Analyst User Guide.

The OFSAA Cash Flow Engine can generate four different kinds of process rules to support 4 different types of forecasting.

- Static Deterministic Process: Static Deterministic simulation of the current book of business.
- Dynamic Deterministic Process: Dynamic Deterministic simulation of the current book of business and a new business forecast.
- Static Stochastic Process: Static Stochastic (probabilistic) simulation of the current book of business.
- Dynamic Stochastic Process: Dynamic Stochastic (probabilistic) simulation of the current book of business and a new business forecast.

Of these four types, BSP only supports Static Deterministic Processes.

In BSP, dynamic deterministic simulation is provided whenever a Planning Administrator or a Planning User requests cash flow processing of a BSP forecast so there is no UI provided that allows a BSP System Administrator to build a Dynamic Deterministic rule. Stochastic Processes are not included because they are inherently probabilistic.

NOTE All the above four kinds of simulation are included with OFSAA Asset Liability Management.

This chapter covers the following topics:

31.1 Overview of BSP Processes

BSP Processes allow you to perform the following tasks:

- Determine the data that you want to process (Product Hierarchy block).

  For BSP processing, you must select the Product Hierarchy method and you must use the Product-Instrument Map.

- Submit to the BSP processing engine the financial element results you want to calculate: (Calculation Elements).

- Specify to the BSP processing engine the product characteristics, prepayments, and forecast assumptions to be used in the process (Rule Selection blocks).
- Specify the Forecast Rate Scenario you want to include.

> **NOTE** BSP does not support Stochastic processing and so does not utilize Rate Index rules.

- Define the output dimension and what additional attributes you want to be updated at the instrument level (Output Preferences block).

> **NOTE** For BSP, you must select Product/Org/Currency. Also, note that BSP does not support instrument-level outputs.

- Enable the output of detailed cash flows or forecast interest rates for audit purposes (Audit Options block).
- Define the processing parameters for a reprocess on an existing run or an entirely new process (Processing Parameters block).
- Formulate and execute the BSP processing request and generate results (BSP Process Summary Page).

Following icons are available on the Process Summary grid:

- **Add**: Click **Add** to begin the process of building a new BSP Process Rule. The Add icon is disabled if any rows in the summary table are selected.
- **View**: Select a single row in the summary table to enable the View icon. The View control allows you to view the contents of a Process on a read-only basis. The View control is only enabled when a single Process rule has been selected.
- **Edit**: Select a single row in the summary table that enables the Edit icon. Click Edit to modify an existing Process rule. The Edit icon is only enabled when a single Process rule is selected.
- **Copy**: Select a single row in the summary table to enable the Copy icon. Click Copy to create a copy of an existing Process rule. The Copy icon is only enabled when a single Simplified Batch is selected.
- **Check Dependencies**: Select a Process rule and then click Check Dependencies to generate a report on all rules that utilize your selected interest rate curve.

  The Check Dependencies icon is only enabled when a process is selected.
- **Delete**: Select one or more rows in the summary table to enable the Delete icon. Click Delete to deletes the process rules that are selected.

- **Execute**: Select a single row in the summary table to enable the Execute icon. Click Execute to execute the selected process. The Execute icon is only enabled when a single Process rule is selected.
- **Refresh**: Click Refresh to refresh the Process Rule summary page.

31.2 Creating a BSP Process Rule

To define a BSP Process Rule, complete the following steps:

1. Navigate to Balance Sheet Planning > BSP Processing > Static Deterministic Process.
2. From the Summary Page, click the “Add New” icon.
3. The process will take you through a series of required steps to define the flow depending upon what type of process you selected. For each of the blue highlighted boxes in the process flow area, you are required to make a selection.

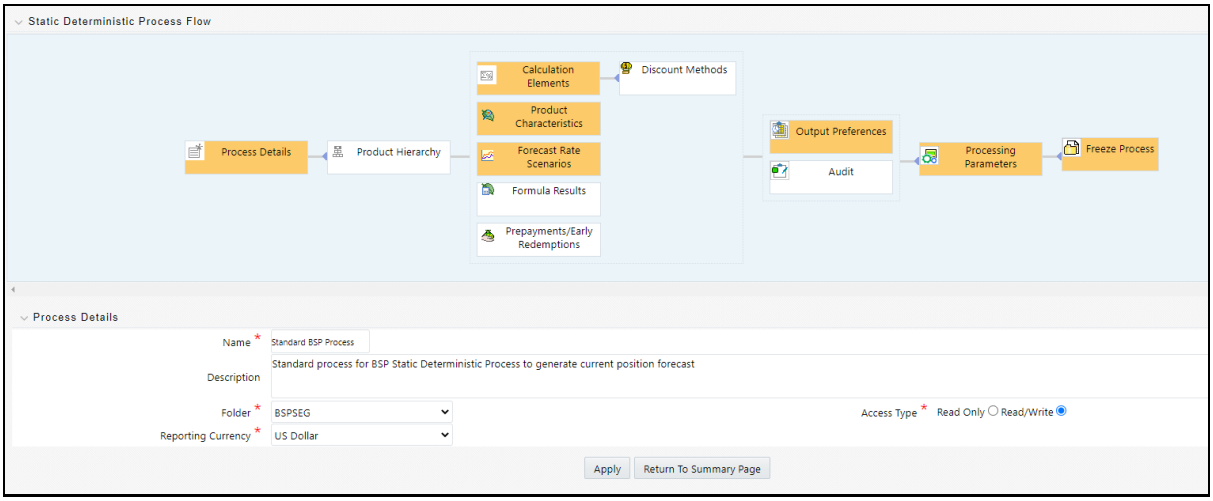
> **NOTE** The gray boxes are optional but will affect the result set if defined.

31.2.1 Creating a Static Deterministic BSP Process Rule

BSP Static Deterministic processes operate on instrument-level data to generate outputs based on a set of user-defined forecast rate scenarios. BSP Static Deterministic processes only generate information about current position instrument data; they do not generate any forecast data related to new business. In BSP, new business forecast outputs are generated within Dynamic Deterministic processes that are executed from BSP's planning user interfaces.

1. Fill in the necessary details in the Process Details block:
   - Name
   - Folder and Reporting Currency from respective drop-down menus
   - Click “Apply”. The process will take you to the Product Hierarchy selection options.

Figure 226: Product Details



2. In the product Hierarchy Block:

   a. Select a Product Hierarchy and select nodes from the hierarchy corresponding to data you want to include in the process,

      OR

      Select a Product Hierarchy and select nodes from the hierarchy corresponding to data you want to include in the process. For BSP, you generally will want to select the root or "Total Rollup" of your chosen Product Hierarchy. If you select lower-level nodes within the hierarchy, you will be filtering out some data and so will not be processing 100% of your current position data.

   NOTE You must use the Product Hierarchy method of selection and you must utilize the Product/Instrument Map approach. For BSP, the Source Selection button which allows you to select named instrument tables is not supported.

   b. Select a Filter (optional), to further constrain the data to be included in the process. Filters work as a secondary constraint, applied after the data set is determined based on Product Hierarchy member selection. For BSP, you generally will not want to add any filters to the process.

   NOTE Do not use Default Product Member (value of -1) within a Product Hierarchy, for Processing. For example, if the process is running on Product Hierarchy of Common Chart of Account, do not use the default chart of account member of -1.

   There are four types of filters:

   - Data Element Filter
   - Hierarchy Filter
   - Group Filter
   - Attribute Filter

NOTE

Before using the product hierarchy approach for selecting data to include in your process, there is a procedure that must be run ("PRODUCT TO INSTRUMENT MAPPING"). This procedure can be executed from the Batch Scheduler – Run - interface.

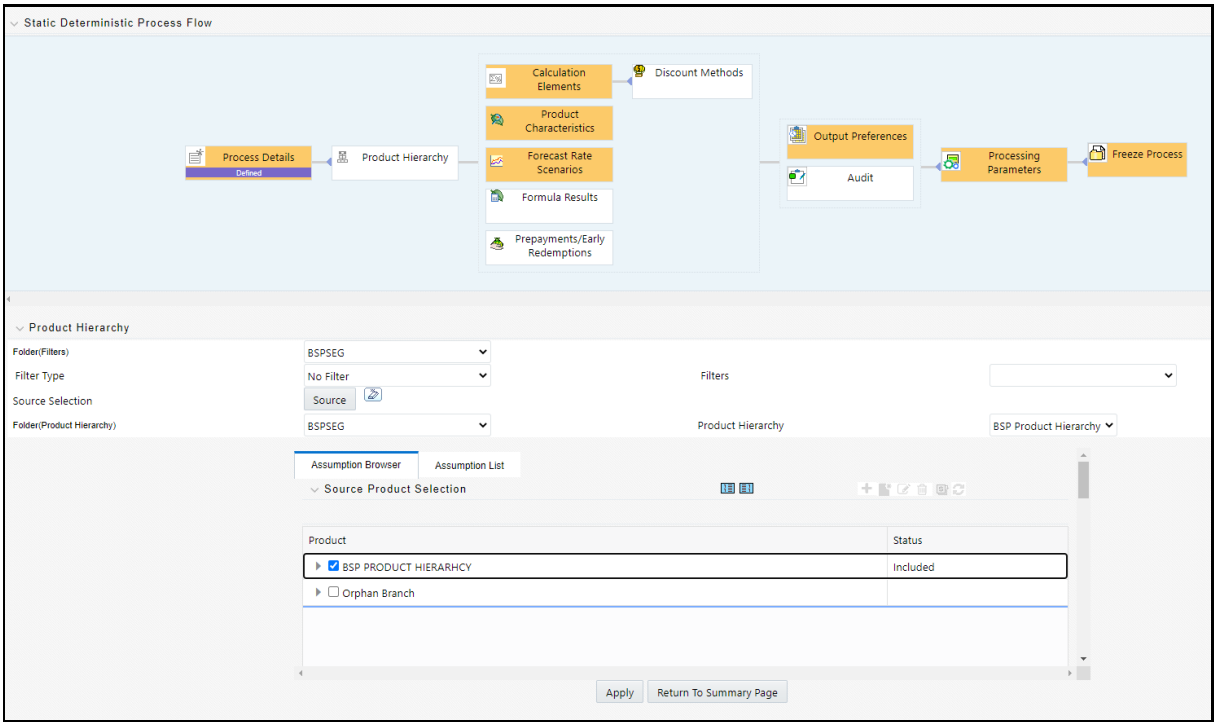
The purpose of the Product to Instrument mapping procedure is to scan all instrument tables (FSI_D_xxx) and populate the mapping table ("FSI_M_PROD_INST_TABLE_MAP") with a listing of the product dimension members that exist within each instrument table. When you select Products (parents or children) within an ALM or FTP process definition, the process refers to this mapping table to identify the instrument tables to include in the process.

It is recommended that you establish an internal process whereby this procedure is executed after every data load to ensure that mappings are up to date.

Related Topics: For more information on the Product to Instrument mapping procedure, see Oracle Financial Services Analytical Applications Data Model Utilities User Guide.

c. Select Apply.

Figure 227: Static Deterministic Process Details

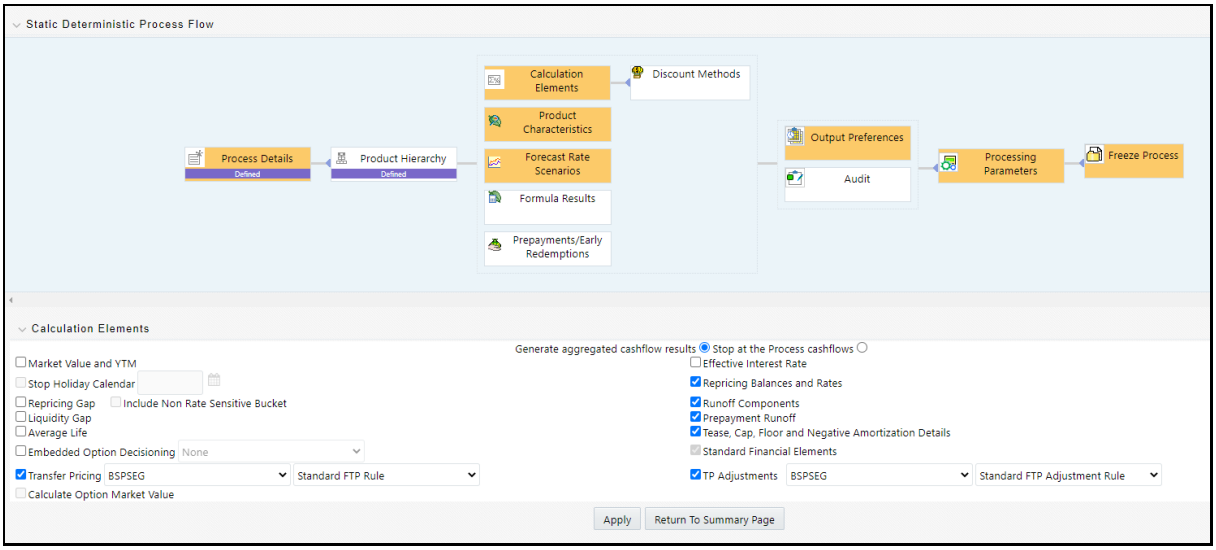


3. Calculation Elements – The boxes in blue with the yellow highlight are required for the definition of the process.

a. In the Calculations Elements block, select either the Generated aggregated cash flow results or Stop at the Process cash flows option. By default, the Generated aggregated cash flow option is selected and required for most BSP results processing. The Stop at the Process cash flows option is only used when you do not require the aggregated results and wish to only compute detailed cash flows in the FSI_O_PROCESS_CASH_FLOWS table. This is used

by users who integrate with Liquidity Risk Management and need to create cash detailed flow output for a large number of instrument records. In this case, the aggregate output is not needed. The Stop at process cash flows option does not write to the Result Detail or Result Master tables that BSP requires.

Figure 228: Static Deterministic Process Details



b. Choose the optional transfer pricing calculation elements to include in the process run: Transfer Pricing folder and rule plus TP Adjustments folder and rule.

Market Value, YTD, Duration, DV01/PV01, Repricing Gap, Liquidity Gap, and Average Life calculations are not supported in BSP. These options should not be selected.

c. Repricing GAP is not supported in BSP

d. Liquidity Gap and Average Life options are not supported in BSP.

e. Embedded Option Decisioning is not supported in BSP.

f. The Calculate Option Market Value option is not supported in BSP.

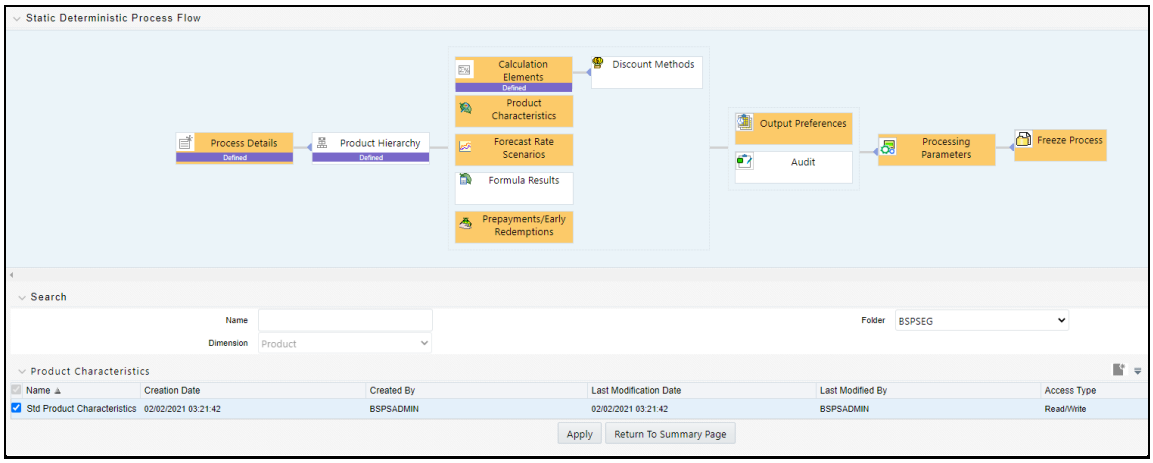
> **NOTE** For details on the options not supported by BSP, see the OFSAA ALM User Guide.

g. Click **Apply**.

h. Click the Prepayments/Early Redemptions box and choose the defined prepayment rule (see Prepayment Rules). This is an optional step.

4. Product Characteristics: From the Product Characteristics bar, select the desired definition and click **Apply** (see Product Characteristics, for rule definition). The process flow will now take you to Forecast Rate Scenarios.

Figure 229: Static Deterministic Process Details



5. Forecast Rate Scenarios

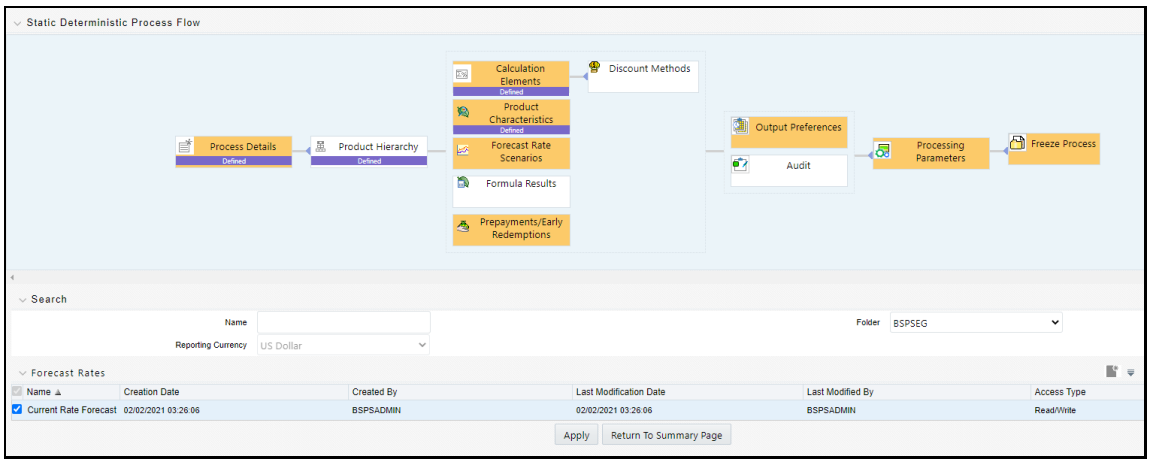
   a. Select the Forecast Rates rule you want to be applied to the process (see Forecast Rate Scenarios for details on setting up rate scenarios).

> **NOTE** Including prepayments rules and prepayment runoff in your process is optional but is standard for most BSP implementations.

   b. Click **Apply**. If you have chosen Runoff Components among your Calculation Elements in step (3) above, the flow will now take you to Prepayments/Early Redemptions.

   If you have not chosen Runoff Components among your Calculation Elements in step (3) above, the flow will take you to step (8): Output Preferences.

Figure 230: Static Deterministic Process Details

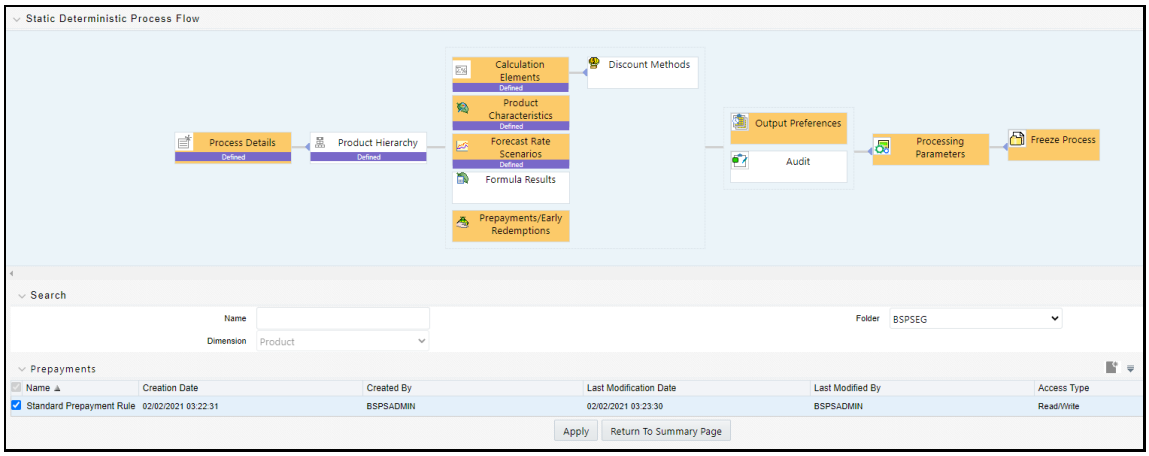


6. Formula Results: Formula Results are not supported in BSP.
7. Prepayments/Early Redemptions:

a. Choose a defined prepayment rule (see Prepayment Rules for details). Again, note that prepayments are optional.

b. Click **Apply**.

Figure 231: Static Deterministic Process Details



8. Output Preferences:

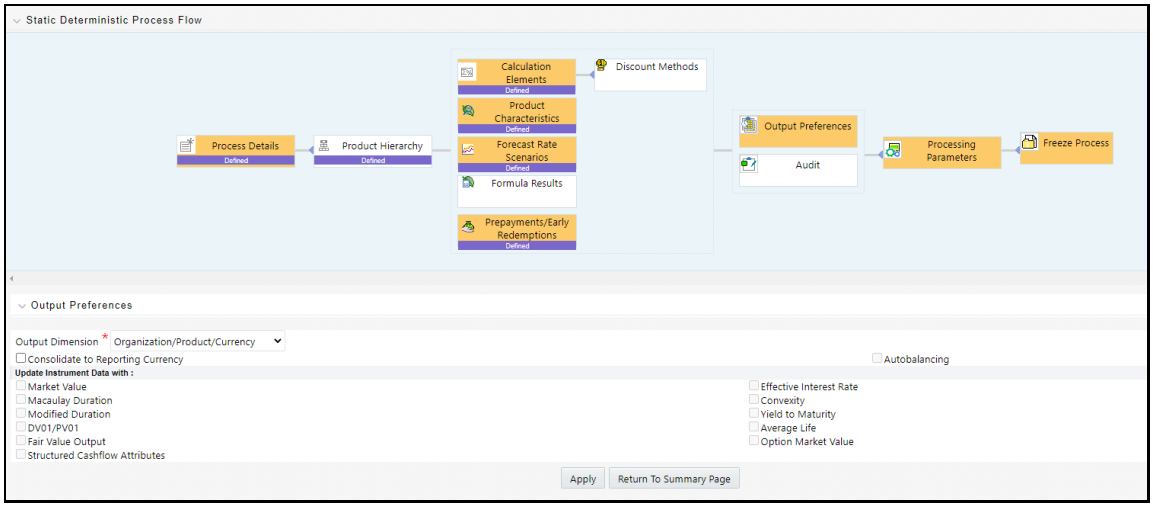
a. Select the output dimension from the drop-down list (Options include Product, Product/Currency, Organization/Product, Organization/Product/Currency). For BSP, you must select Organization/Product/Currency.

b. You may select to update your instrument data with Macaulay Duration and/or Modified Duration. If you update your instrument data with these calculations, BSP will never utilize them directly.

c. BSP does support any of the other Output Preference items.

d. Click **Apply**. The process will take you to the Processing Parameters section or you can optionally click the Audit box. If no audit options are required, skip to step #10, Processing Parameters.

Figure 232: Static Deterministic Process Details



9. Audit Preferences

a. Detailed Cash Flows:

Check the box to record the cash flows and repricing events occurring for the desired number of records processed. For each record, daily results are written to the FSI_O_PROCESS_CASH_FLOWS table. The data in this table uses the RESULT_SYS_ID, which identifies the Process used. Select from the options below:

If you have selected Detailed Cash Flow outputs, then you must select either 'Number of Records to be Output' or 'All Records'.

In the financial elements tab below, you have the option to select the FE's you want to output in the detail cash flows table. Highlight the items in the available section and move the selection over to the selected section.

b. Tiered Balance Cash Flows:

BSP does not support Tiered Balance Cash Flows.

c. Forecast Rates

Select Forecast Rates to write forecast exchange, interest rates, or economic indicator results to the following tables: FSI_EXCHANGE_RATES_AUDIT, FSI_INTEREST_RATES_AUDIT, and/or FSI_ECONOMIC_INDICATORS_AUDIT. For more information on the table structures, see the Oracle Financial Services Analytical Applications Data Model Data Dictionary.

Highlight items from the available code section for the desired forecast type (Interest Rate, Exchange Rate, or Economic Indicator) and move selection (or all) to the selected items box.

d. Click **Apply**. The process flow will take you to Processing Parameters.

10. Processing Parameters

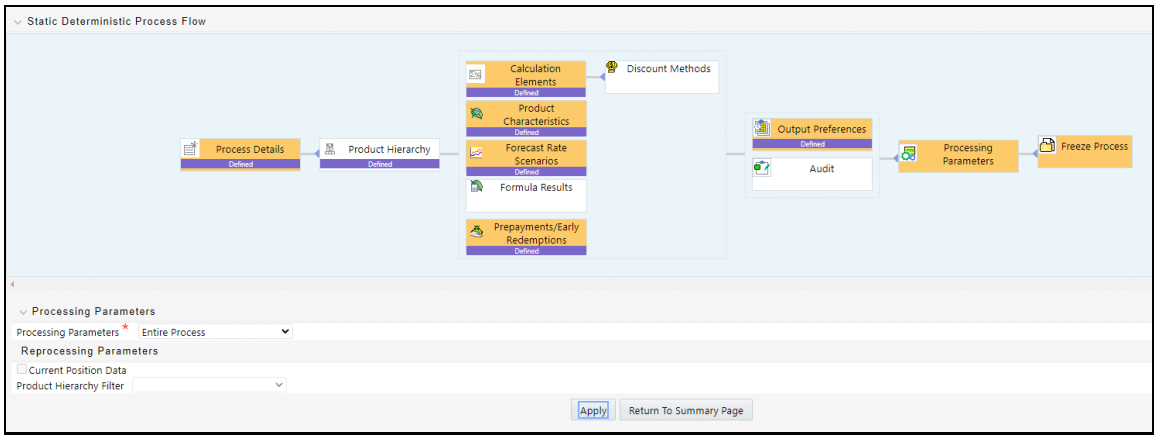
a. The processing parameters allow you to run an entire process or re-process a portion of an existing run. For BSP, you will generally want to run the Entire Process. From the drop-down list, select Entire Process or Selective Reprocess.

b. If Selective Reprocess is selected, you can click the box "Current Position Data" to reprocess that particular data set. With selective reprocessing, you can run a subset of the process to replace invalid products and to add new products. With Selective Reprocess, the Reprocessing components are enabled to selected components for reprocessing. When the Process Rule is executed, the data in the result tables are not immediately deleted. The data for the selected subset is replaced, but the rest of the results remain intact.

c. Select the desired product Hierarchy Filter from the drop-down list to indicate which products should be re-processed.

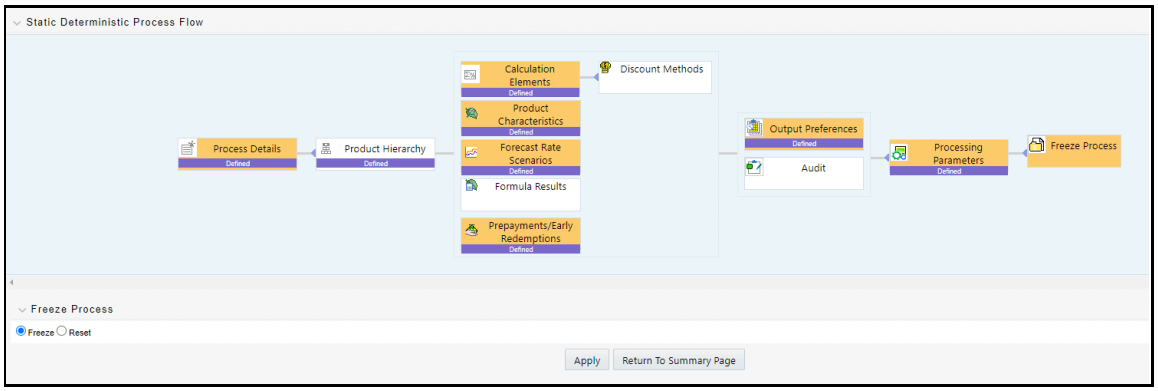
d. Click **Apply** and the screen will take you to the Freeze Process section.

Figure 233: Static Deterministic Process Details



11. Freeze Process
    a. Select Freeze to complete the process.
    b. Select Reset to erase all selections made previously within the process definition flow.
    c. Select **Confirm**.

Figure 234: Static Deterministic Process Details



31.3 Executing a BSP Process

To run a Process ID, follow these steps:

1. Choose Process/Run from the list under the process bar.
2. Click the run icon to execute the process.
3. A popup window will appear including the execution ID. Click OK.
4. When a process is running the status bar will show one of the following three values: success, failure, and processing.

> **NOTE** The process must be defined completely.

5. When the Status "View Log" appears, the run is complete.

> **NOTE** Click the refresh grid button to see the change in status.

6. Click the "View Log" status to ensure the Run was complete.
7. To view the error log, click the "Task id" number on the view log page.

32 Data Aggregation and Stratification

Data Aggregation and Stratification enables you to summarize large volumes of financial instruments to a manageable scale for processing purposes. The engine that does the aggregation and stratification processing is the Data Stratification Rule. This application enables you to perform mathematically intensive calculations on a relatively small number of instrument pools that are proxies for a much larger number of individual instrument records. Using this feature is a multi-step process, which includes:

- Understanding what you want and how you want to aggregate and stratify data.
- Optionally defining balance or rate tiers to be used for grouping data.
- Configuring the Data Map metadata for the source and target data maps that are to be used on the Stratification Definition page.
- Setting up stratification definitions and rules in the Stratification Rule pages.
- Testing the rules that you create.

32.1 Stratification Action Operations

When creating pools of instruments, you need to identify the operation for each of the attributes. You have the following choices in terms of how to populate each attribute in the instrument pool from the instrument data:

- **Discrete**: Directs the Aggregation and Stratification engine to populate the instrument pool with discrete values.

  This option populates the pool with discrete values for an attribute if there is no logical or mathematical way to group instruments with different values, and the attribute is significant for processing purposes. Choosing the discrete action for an attribute ensures that only instruments with matching values are grouped in a pool. The discrete action may be the correct choice for important code fields. Be careful when using the discrete action on the Amount, Date, or Rate Fields. These types of fields tend to have many discrete values. A typical value for a discrete group by is a dimension ID field or a yes or no flag.

- **Group by**: Use for dimensions or other attributes that you want to use to group the detailed data.

  This option allows you to select columns that you want to use to group the instrument data. This will be used for dimension columns like Product, Org Unit or Currency, or any other dimensions that are needed for grouping the data.

- **Tier**: If you want to group the data by ranges of values, you can define the ranges using Stratification Tiers.

  Tiers are used for balance and rate fields to assist in grouping similar data into tranches or pools. Tiers should be defined on columns that affect the way assumptions are made, such as prepayments, interest rate margins, or other meaningful assumptions.

32.2 Aggregation Action Operations

The following are the default aggregation action operations:

- **Average**: Calculates the average value of an attribute for all instruments in the pool.
- **Weighted Average**: Calculates the average weighted value for an attribute by the current balance.

  Examples of attributes for which you may want to calculate the weighted average are interest rate fields: interest rates, cap rates, floor rates, and interest rate margins for floating rates. Other possibilities include the remaining term, original term, loan to value, and so forth.
- **Min, Max (minimum, maximum)**: Select one of these operators to populate the pool with the minimum or maximum value of a given attribute for all the instruments that are part of the pool.
- **Median**: Applies the Median Date value for all date values in the pool.
- **Sum** (The sum action calculates the total sum value for a numeric attribute.

  The most common attributes that you want to calculate the sum for are the balance and payment amount fields. By calculating the total of the balance and payment amounts, the total of all pool balances should reconcile to and represent the totals of all instruments that are in the portfolio.
- **Default**: Applies a specified default value.

32.3 Stratification Tips

Consider this criterion when evaluating how you want to stratify data:

- When identifying attributes that you want to include as part of the instrument pools, keep in mind the primary use of the stratified data you are creating.

  For example, the ALM engine uses only the current balance amount fields for its calculations. As far as the ALM engine is concerned, designing a stratification rule that populates other balance or amount fields is optional.
- You need to identify the stratification criteria for the attributes.

  This step is simplified by the fact that any attributes that you identify as needing to maintain discrete values for, or that are going to be dropped or defaulted by definition, cannot be used as grouping criteria for pools.
- Maximize efficient processing by designing rules to summarize the instruments into as few pools as possible, while at the same time only grouping instruments that generate the same or similar cash flows.

  In other words, all instruments that are grouped into a pool should share common and pertinent financial characteristics.

32.4 Setting up Stratification Definitions

This section discusses how to set up stratification configurations.

To set up the Stratification Configurations, select **Common Object Maintenance**, select **Stratification**, and then select **Stratification Definition**. You can define the aggregation process at any level of complexity.

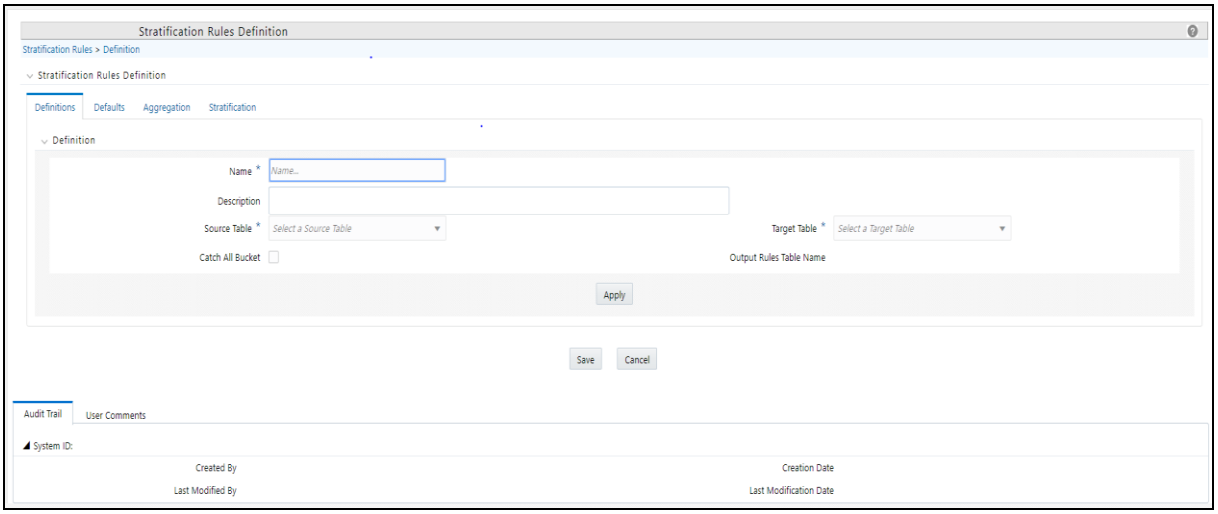
32.4.1 Stratification Configuration

To define the aggregation process at any level of detail of complexity, follow these steps:

1. Navigate to **Common Object Maintenance**, select **Stratification**, select **Stratification Definition** and then select **New** or **Edit**.

   This example illustrates the fields and controls on the Stratification Definition page. You can find definitions for the fields and controls later in this section.

Figure 235: Stratification Rule – Definition Page



2. Establish how you want the Stratification Engine to process amounts, rates, dates, and integers by assigning a stratification action to each.

   Default input applies a default value into the action settings on the Definition page.

3. Select a source and target instrument table, Default Values, Aggregation Actions, and Stratification Actions to complete the definition for each instrument table that you want to aggregate.

32.4.1.1 Setting up Stratification Tier Structures

An alternative to incremental grouping is to group according to tiers. You can use tiers on numbers, amounts, and rate fields. The main difference between using tiers versus other aggregation actions is that you can define the specific tiers that you want to stratify the data into to match business logic, reporting requirements, or both. Tiers also give you more control in terms of limiting the number of strata created for any given attribute to only ranges that are pertinent for processing or reporting purposes. For example, you could define a tier rule that groups the initial balance amounts in increments of 10,000. However, this could result in hundreds of strata if the balance amounts range

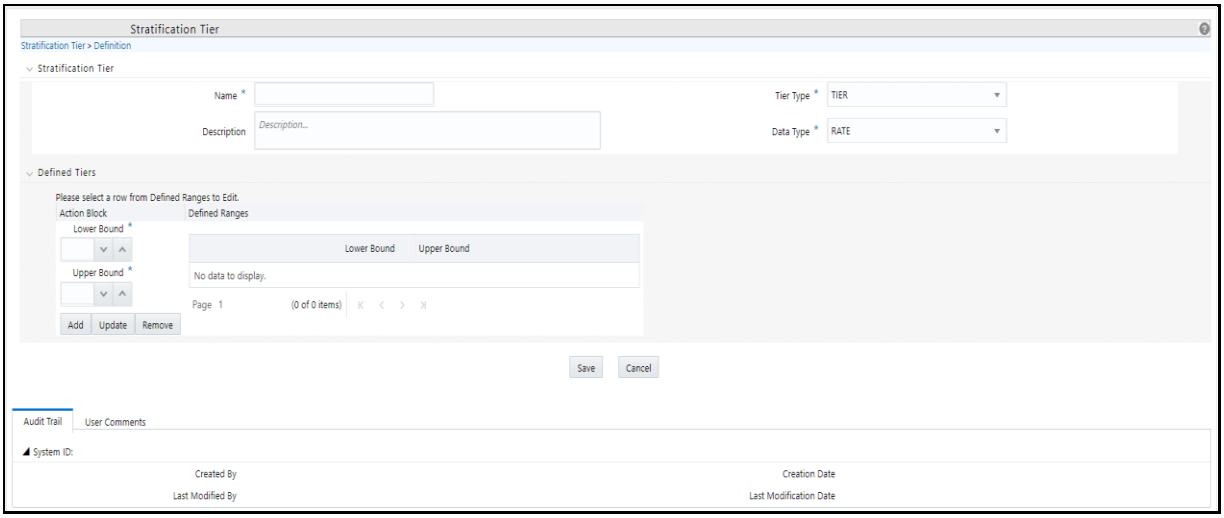
anywhere from 1 to 100,000,000. A more efficient and logical way to group balance amounts may be to set up tiers so that the first tier contains records with amounts between 1 and 50,000; the second tier contains records with amounts between 50,000 and 1,000,000, and the third tier contains records with amounts between 1,000,000 and 100,000,000. Tiers are ideal for handling balance amounts.

To set up Tier Structure, follow these steps, navigate to **Common Object Maintenance**, select **Stratification**, and then select **Stratification Tier**.

Stratify source data into a finite number of pools that are used by the Stratification Definition under Stratification Action.

Use the Tier Definition page to define stratification criteria for creating a finite number of pools that are used by the Stratification Definition - Group by page.

Figure 236: Stratification Tier – Definition Page



This example illustrates the fields and controls on the Tier Structures page. You can find definitions for the fields and controls later in this guide.

Input the lower and upper boundary amounts for each tier and then add them to the definition. The lower bound range must be greater than the prior upper bound amount. These values cannot be equal and do not overlap. The initial lower bound and last upper bound should small enough and large enough to capture all possible values.

Note that under **Tier Type**, *Discrete* is also available to select. This option populates the pool with discrete values for an attribute if there is no logical or mathematical way to group instruments with different values, and the attribute is significant for processing purposes. Choosing the discrete action for an attribute ensures that only instruments with matching values are grouped in a pool. The discrete action may be the correct choice for important code fields. Be careful when using the discrete action on the amount, date, or rate fields. These types of fields tend to have many discrete values. A typical value for a discrete group by is a dimension ID field, code field, or a yes/no flag.

32.4.2 Setting up Stratification Definitions

This section discusses how to set up stratification definitions.

Figure 237: Pages Used to Setup Stratification Rules

Page Name	Navigation	Usage
Stratification Rules Definition - Definition	Common Object Maintenance > Data Stratification > Stratification Definition> Definitions	Specify rule name, description, source data, and target data tables.
Stratification Rules Definition - Defaults	Common Object Maintenance > Data Stratification > Stratification Definition> Defaults	Specify default values for each column type.
Stratification Rules Definition - Aggregation	Common Object Maintenance > Data Stratification > Stratification Definition> Aggregation	Define aggregation actions (or use the default values) for each column in the data map.
Stratification Rules Definition - Stratification	Common Object Maintenance > Data Stratification > Stratification Definition> Stratification	Define how to group or pool the data.

32.4.3 Defining Stratification Rules

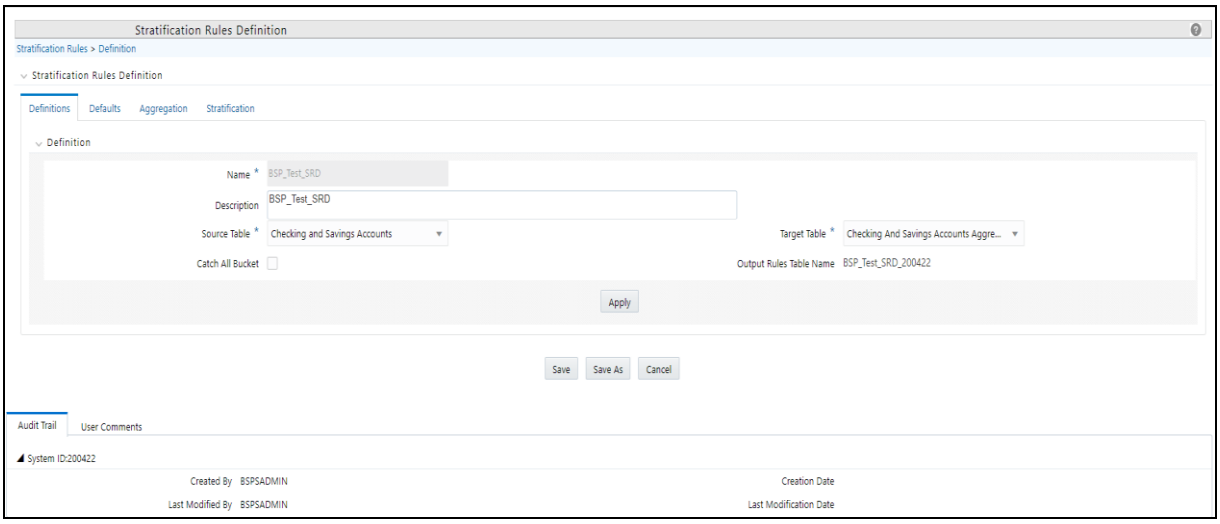
Use the Stratification Rules - Tabs to define Stratification Definition.

To define Stratification Definition, follow these steps:

1. Navigate to **Common Object Maintenance**, select **Stratification**, and then select **Stratification Definition**.

   This example illustrates the fields and controls on the Stratification Rules - Definition page. You can find definitions for the fields and controls later on this page.

Figure 238: Stratification Rules Definition Page

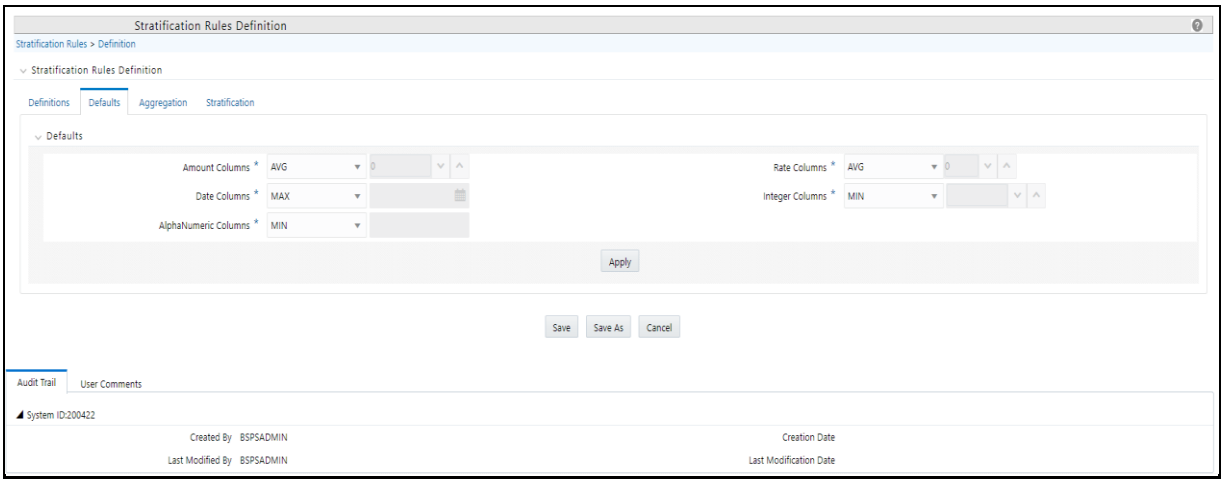


2. Enter a unique **Name** and **Description** for the Stratification Definition rule.
3. Select a **Source Instrument Table**. The list of values will include all seeded and properly registered instrument tables that contain account-level data records.
4. Select a **Target Aggregate Instrument Table**. This table will be populated with the results of the Stratification.

5. Specify whether or not to include a catch-all bucket in the process. This will ensure that all records from the source table are accounted for in the target table.
6. Click **Apply** to save your inputs and navigate to the next tab.

   This example illustrates the fields and controls on the Stratification Rules - Defaults Page.

Figure 239: Stratification Rules Definition – Defaults Tab

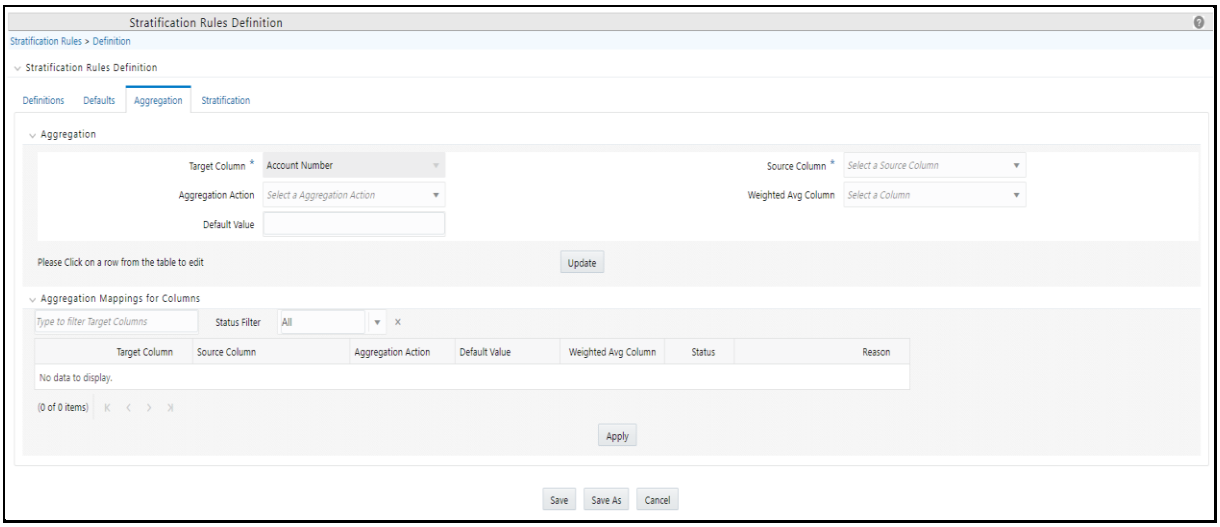


To define Stratification Defaults, follow these steps:

7. Select the Amount default. Possible selections are MAX, MIN, SUM, AVG. The recommended selection is SUM.
8. Select the Date default. Possible selections are MAX, MIN, MEDIAN. The recommended selection is MEDIAN.
9. Select the AlphaNumeric default. Possible selections are MAX, MIN. The recommended selection is MAX.
10. Select the Rate default. Possible selections are MAX, MIN, SUM, AVG, and Weighted Average. Recommended selection is Weighted Average. If Weighted Average is selected, then additionally select the balance column to use for weighting.
11. Select the Integer default. Possible selections are MAX, MIN. The recommended selection is MAX.
12. Select **Apply** to save your inputs and navigate to the next tab.

    This example illustrates the fields and controls on the Stratification Rules - Aggregation Page.

Figure 240: Stratification Rules Definition – Aggregation Tab



To define Stratification Aggregation details, follow these steps:

13. Select the specific row you want to define from the bottom half of the page.

    You have the option to use the default values previously input on the Defaults tab or you can input a different Aggregation Action at the top of the page.

14. Use the pagination selections at the bottom of the page to address/review all columns or type the column name or a portion of the column name to navigate directly to a specific column.

15. Select **Apply** to save your inputs and navigate to the next page.

    This example illustrates the fields and controls on the Stratification Rules - Stratification Page.

To define Stratification/Group by details, follow these steps:

16. Select the Column(s) and Stratification Action that you want to use for grouping the detailed records into aggregate/pooled records. Typical columns used for grouping will be dimension columns, balance or rate columns, or any other meaningful columns that you want to be unique for each pool record.

17. For each Stratification column, select the Stratification Action. Options are Tier, Discrete, and Group by. Both the Tier and Discrete options require an additional Stratification Tier definition to be selected.

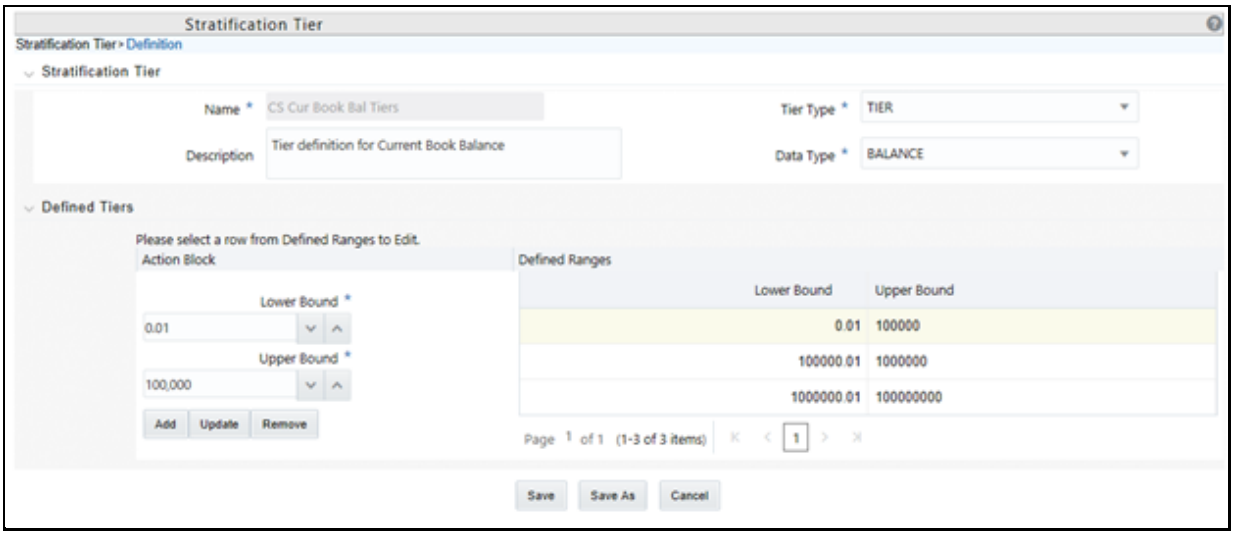
18. Select Apply to save your inputs and remain in the rule or select Save to save your inputs and close the rule.

32.4.4 Defining Stratification Tiers

To define stratification tiers, follow these steps:

1. Navigate to **Common Object Maintenance**, select **Stratification**, and then select **Stratification Tier**.

Figure 241: Stratification Tiers - Fields and Controls



2. Provide a unique **Name** and **Description** for the Stratification Tier.
3. Select the **Tier Type**, for example, **Tier** or **Discrete**.
4. Select the column **Data Type** that this definition will apply to. This selection will limit the columns where this Tier rule will be available for selection in the Stratification Definition Rule.
5. Define each tier with lower and upper bounds and add as a defined range. Click **Add** to add the tier. Additionally, use **Update** or **Remove** to manage the individual tier definitions.
6. After all Tier ranges are defined, select **Save** to save the assumptions and exit the Tier screen.

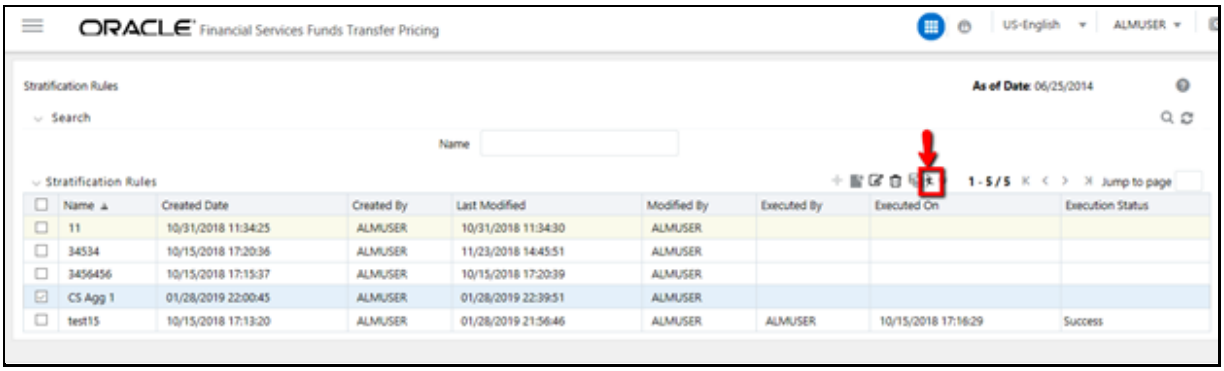
   The tier definitions created in this step are mapped to the individual columns in the Stratification Definition rule on the Stratification tab.

32.4.5 Executing a Stratification Rule

To execute a stratification rule, follow these steps:

1. Navigate to the Stratification Rule Summary Page.

Figure 242: Stratification Rules



2. Select the **Stratification Rule** you want to process.
3. Select the **Run** icon.
4. Select the As-of-Date for the instrument data you want to aggregate.
5. Select **OK** to begin the process.

32.4.5.1 Using SQL* Plus to Execute a Stratification Rule

You can also execute the stratification rule either from SQL*Plus or from within a PL/SQL block OR from ICC Batch UI within the OFSAAI framework.

To Run the procedure from SQL*Plus, login to SQL*Plus as the Schema Owner. The function requires four parameters. Following is the syntax for calling the procedure:

```
declare
result number;
begin
---- Call the function
result := fn_insert_into_data_strat_tab(batch_id => :batch_id,
mis_date => :mis_date,
stratification_id => :stratification_id,
user_name => :user_name);
end;
```

- **batch_id**: any string to identify the executed batch
- **mis_date**: in the format YYYYMMDD
- **stratification_id**: numeric system id of stratification rule
- **user_name**: OFSAA user id of the user executing the function

Example:

```
declare
result number;
begin
---- Call the function
result := fn_insert_into_data_strat_tab(batch_id => 'abc',
```

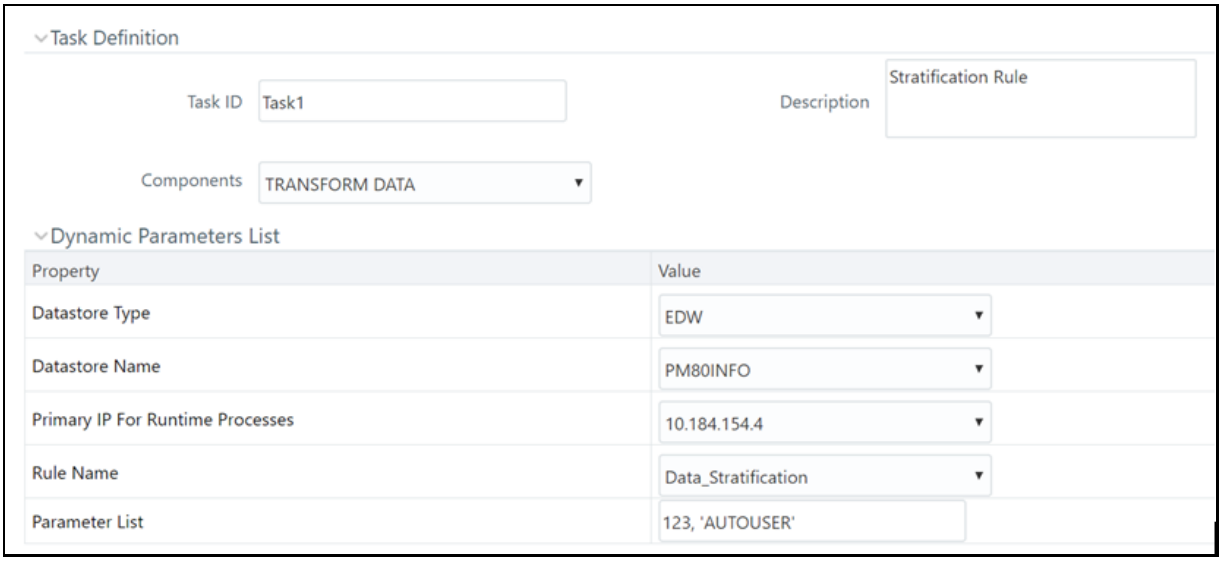
```
mis_date => '20180601',
stratification_id => 123,
user_name => AUTOUSER);
end;
```

32.4.5.2 Using ICC Batch Framework

To execute the procedure from the OFSAAI ICC framework, create a new Batch with the task as TRANSFORM DATA and specify the following parameters for the task:

- **Datastore Type**: Select appropriate Datastore from the list
- **Datastore Name**: Select appropriate name from the list
- **IP Address**: Select the IP address from the list
- **Rule Name**: Data_Stratification
- **Parameter List**: stratification_id, user_name

Figure 243: Stratification using ICC Batch Framework



After the Stratification rule execution is complete, you can compare balances from the source table and target table to ensure all data has been accounted for, such as the sum of current balance from the source table should equal the sum of the current balance in the target table.

After the data has been populated and verified in the aggregation tables, it is ready for processing by the ALM and (or) FTP applications. You can select either regular instrument tables or aggregate instrument tables in the ALM and TP Processes under Source Selection. Select only one. Selecting both in the same process will lead to double counting of the balances.

32.4.6 Creating New Aggregate Table

The following aggregate tables are seeded with the Application Data Model:

Figure 244: Seeded Aggregation Tables with the Application Data Model

#	Logical name	Physical table name
1	Annuity Contracts Aggregate	FSI_D_ANNUITY_CONTRACTS_AGGR
2	Borrowings Aggregate	FSI_D_BORROWINGS_AGGR
3	Checking And Savings Accounts Aggregate	FSI_D_CASA_AGGR
4	Credit Cards Aggregate	FSI_D_CREDIT_CARDS_AGGR
5	Credit Lines Aggregate	FSI_D_CREDIT_LINES_AGGR
6	Guarantees Aggregate	FSI_D_GUARANTEES_AGGR
7	Investments Aggregate	FSI_D_INVESTMENTS_AGGR
8	Leases Aggregate	FSI_D_LEASES_AGGR
9	Loan Contracts Aggregate	FSI_D_LOAN_CONTRACTS_AGGR
10	Money Market Contracts Aggregate	FSI_D_MM_CONTRACTS_AGGR
11	Mortgages Aggregate	FSI_D_MORTGAGES_AGGR
12	Retirement Accounts Aggregate	FSI_D_RETIREMENT_ACCOUNTS_AGGR
13	Term Deposits Aggregate	FSI_D_TERM_DEPOSITS_AGGR

To create a new aggregate table in addition to the basic instrument and leaf columns, the following mappings must be done in the data model:

- Super-type
  - INSTRUMENT_AGGREGATE
  - INSTRUMENT_AGGREGATE_BASIC
- Table classification
  - EPM Aggregation (701)

This may be required when you create a custom instrument table and want to use stratification for it.

33 Andrew Davidson and Company (ADCo) Prepayment Method

The Andrew Davidson & Co (ADCo) prepayment method calculates the prepayment amount for a combination of currency equal to US Dollar and Product Account equal to Type Earning Asset. ADCo related UI inputs and the CFE execution are available only for a user who is an ADCo Licensee and where the specific user has the ADCo function mapped to them.

33.1 Deployment of ADCo Libraries on OFSAAI

The following are the objectives of deploying ADCo Libraries on OFSAAI:

- Deploy ADCo libraries on OFSAAI
- Enable ADCo prepayment-model functionality in BSP

The following are the objectives of deploying ADCo Libraries on OFSAAI:

- BSP 8.0
- ADCo v1.9 libraries for Loan-Dynamic-Model, for your operating system/version

> **NOTE** ADCo is not available on IBM AIX operating systems.

33.1.1 Steps

- Preparation:
  - **a.** Log in to the UNIX Profile where the OFSAAI database tier is installed.
  - **b.** Create a folder called “adco”; create 3 sub-folders under “adco”: “io”, ”data”, “lib”
  - **c.** Edit the .profile script and set the following environment variables:

    ADCO_IO_DIR: set it to the absolute path of the “io” sub-folder created earlier.

    DATAFILEDIR: set it to the absolute path of the “data” sub-folder created earlier.

    LD_LIBRARY_PATH: update this environment variable to include the absolute path of the “lib” sub-folder created earlier.
  - **d.** Stop all OFSAAI services.
  - **e.** Log out of the UNIX Session and log back into UNIX. Verify that the 3 environment variables created above are set properly.
  - **f.** Start all OFSAAI Services.
- Deployment:
  - **a.** Download the v1.9 ADCo libraries and place the file “'libadppmdl. so” into the “adco/lib” sub-folder.

b. Place the monthly license-key and historical-rate files into the "adco/data" sub-folder.

c. If you have been provided the following 2 files by ADCo, place both of these files in the "adco/io" sub-folder.

ADCO_DefaultValues_INACTIVE.txt

ADCO_XMLSettings_INACTIVE.txt

- Enable ADCo functionality in BSP:
  a. Login to OFSAAI.
  b. Under the OFSAAI Home Page, go to Administration -> Security Management
  c. Expand System Administrator and click "Function – Role Map".
  d. Associate the SMS-Function "ADCO Prepayments for BSP" with the required roles.

33.2 Procedure For Setting Up ADCo Process

The steps to set up an ADCo process are as follows:

1. Mapping of the ADCo function to BSP Admin user
2. Set up the 7 Indices to use with ARMs.
3. Set up the 2 years, 10 year rate IRCs.
4. Set up the National HPI.
5. Load the STG_LOAN_CONTRACTS table.
6. Run the T2T batch to populate the FSI_D_MORTGAGES table.
7. Select the NHPI from Application Preferences.
8. Forecast the 2 years, 10 year rate IRCs.
9. Forecast the 7 indices (only required where indices are mapped to ARMs).
10. Forecast the National HPI (optional).
11. Setup the Prepayment rule mapping the ADCo method to the required Mortgage – USD combinations.
12. Setup the Static Deterministic Process including the rules defined above (Forecast Rates and Prepayments).
13. Select the SMM Rates Output flag (optional).
14. Execute the Process.

The detailed procedure for using the ADCo prepayment method comprises utilizing the above mentioned specific settings in various BSP modules as documented in the following sections.

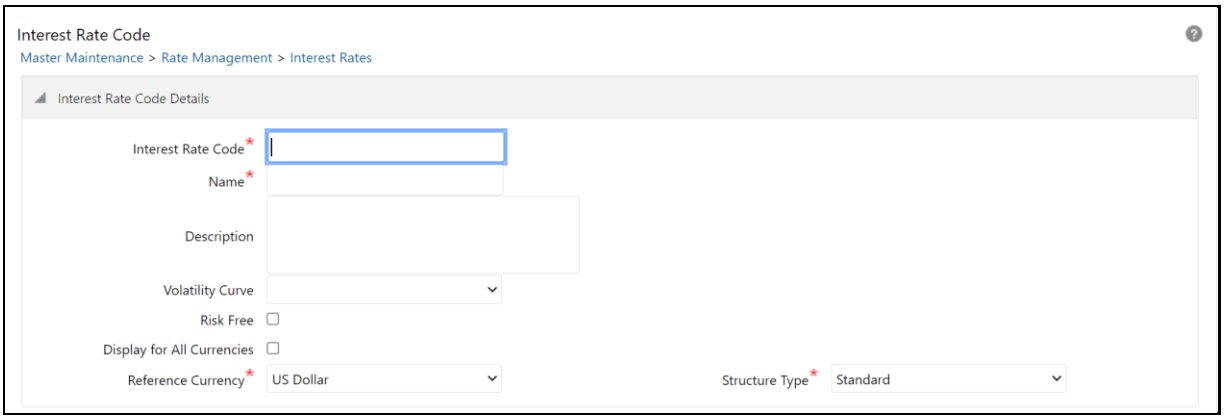
33.2.1 Mapping of the ADCo function

After acquiring the ADCo license, the user must manually map the ADCo function to the BSP Admin user in the Role Function Mapping screen of Security Management (Home>Administration>Security Management). Only after this mapping, will the user be available to view the ADCo related changes

made in the Forecast Rates and Prepayments screens. This does not apply to the common screens of Rate Management and Application Preferences. For more details on security management, see Oracle Financial Services Analytical Applications Infrastructure User Guide.

33.2.1.1 Rate Management

Figure 245: Interest Rates Maintenance Screen



In the Rate Management Interest Rates detail screen, is a drop-down list called the Curve Identifier. This is a drop-down list that contains the list of 4 curve identifier types, that is, par treasury, zero coupon treasury, par LIBOR/swap, and zero coupon LIBOR swap. These curve identifiers can be mapped to the seven indices to be used with the Adjustable Rate Mortgages(ARMs) meant for ADCo purpose, whose reference currency is always US Dollar. The seven indices are:

Element Name	Element Description
PAR_TSY_1YR	1-Year Par Treasury Monthly Yield (%)
PAR_LIBOR_6M	6-Month Par LIBOR Monthly Yield (%)
PAR_LIBOR_1YR	1 Year Par LIBOR Monthly Yield (%)
MTA_12	12 Month MTA Monthly Yield (%)
PAR_TSY_3YR	3-Year Par Treasury Monthly Yield (%)
PAR_TSY_5YR	5-Year Par Treasury Monthly Yield (%)
COFI_11D	11th District COFI Monthly Yield (%)

The user has to define the 7 indices for use with the ARMs, with the same name as expected by ADCo. Also, the IRC to supply 2 years and 10 year rates must be defined in this UI. Users need not enter the Term structure parameters if the IRC is to be used only for ADCo purposes.

Economic Indicators:

In the Economic Indicators detail screen, the historical data for the National Housing Price Index (NHPI) is entered. Setting up the NHPI is an optional step.

Loading the STG_LOAN_CONTRACTS table:

For ADCo, this step of loading the STG_LOAN_CONTRACTS table should be performed. The following are the columns that have been included in this table for ADCo Purpose:

COLUMN_NAME	DISPLAY NAME
d_last_delinquent_date	Last Delinquent Date
f_payment_option_flag	Payment Option Flag
f_relo_loan_flag	Relocation Loan Flag
f_sub_prime_flag	Sub Prime Flag
n_first_reset_cap	First Reset Cap
n_first_reset_floor	First Reset Floor
n_joining_score	Original Credit Score
n_loan_charge	Loan Charge
n_mrtgg_insrn_amount	Mortgage Insurance Amount
n_mrtgg_insrn_cutoff	Mortgage Insurance Cutoff
n_mrtgg_insrn_premium	Mortgage Insurance Premium
n_no_of_interest_only_mths	Number of Interest Only Months
n_no_of_prop_units	Number of Property Units
n_orig_cust_ltv	Original Customer LTV
n_prepmt_index_term	Prepayment Index Term
v_loan_doc_status	Loan Documentation Status
v_prepmt_index_cd	Prepayment Index Code
v_prepmt_index_term_unit	Prepayment Index Term Unit
v_prop_loc_state_cd	Property Location State Code
v_prop_purpose_cd	Property Purpose Code
v_prop_sub_type_cd	Property Sub-Type Code

Running the T2T Batch to populate the FSI_D_MORTGAGES table:

To run the T2T Batch to populate the FSI_D_MORTGAGES table, perform the following steps:

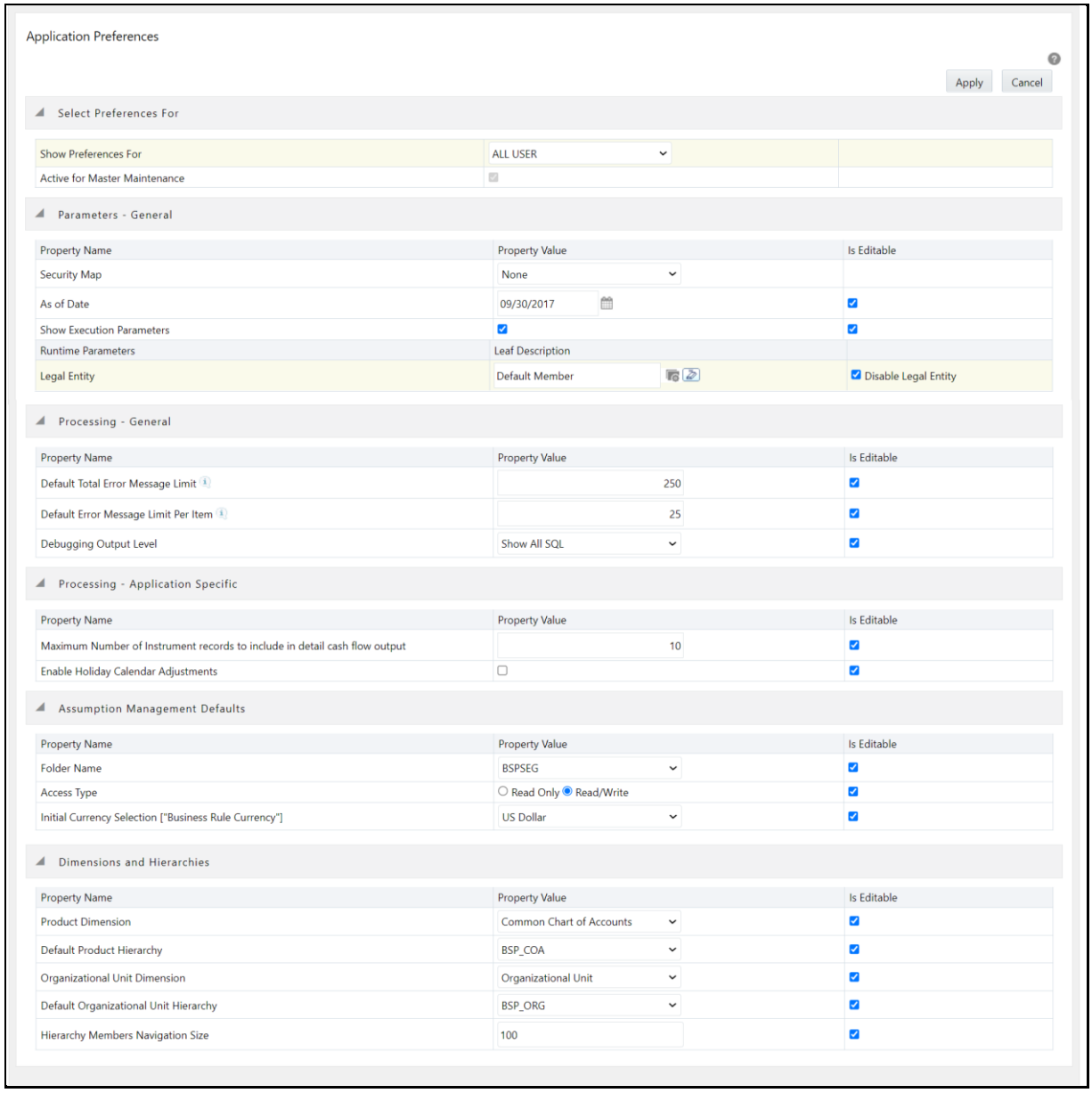
1. Navigate to Common Object Maintenance > Operations.
2. Set up a batch in the Batch Maintenance UI.
3. Select the above batch set up in step 2 and for a particular information date, execute the batch. This populates the FSI_D_MORTGAGES table.

33.2.1.2 Application Preferences

In the ADCO Parameter grid, there is an input parameter called National Housing Pricing Index(NHPI).

National Housing Pricing Index (NHPI) - This is an input parameter for ADCo definition purpose, that the user has to select from the drop-down containing the list of all economic indicators defined from Rate Management. The user is required to set up an NHPI economic index if they desire to override the base Adco NHPI forecast. This is an optional step.

Figure 246: Application Preferences



Product Characteristics

Define Other Mortgage Attributes: This tab is available only if the user has an ADCo License.

For more information, see Product Characteristics.

33.2.1.3 Forecast Rates

Interest Rate Forecast Methods:

In the case of an ADCo IRC forecast, while defining using Direct Input, the 'Show 360 months Buckets' check box is shown ONLY if the BSP_ADCO function is mapped to the user.

- By default, the check box is unchecked (or the check box is not shown), and the UI continues to display its existing behavior.
- If the user checks the box, then the UI shows 360 month rows and the date display follows the MMM-YYYY format.

Forecasting the 7 indices is similar to forecasting the 2 years and 10 year rate IRCs having term points as 2 years and 10 years.

Economic Indicator (EI) Forecast Methods:

The UI has a similar behavior for the EI forecasting method selection of “Direct Input”. But UI checks for the National HPI Selection in Application Preferences. In the BSP Process screen, UI shows the audit options for ADCo, ONLY if the BSP_ADCO function is mapped to the user. Forecasting the NHPI is an optional step.

33.2.1.4 Prepayments

Defining Prepayment Methodologies:

Oracle Balance Sheet Planning provides five prepayment calculation methods: Constant, Prepayment Model, PSA, Arctangent, and ADCo (Andrew Davidson and Co.) Prepayment method.

Defining the ADCo Prepayment Method:

Use this procedure to define prepayment assumptions using the ADCo Prepayment method.

Prerequisites:

Performing basic steps for creating or updating a Prepayment rule.

Procedure:

1. Select the currency to be US Dollar and Product Account Type as an Earning Asset.
2. Select ADCO Prepayment method from the Prepayment method drop-down list. The UI shows the “ADCO Prepayment” method as an available method in the drop-down list, ONLY if the BSP_ADCO function is mapped to the user.
3. Select Refinance or Curtailment from the Calculation drop-down list.
4. The ADCO Prepayment container is displayed containing the index drop-down list which contains IRCs defined in Rate Management including the seven indices to be used with the Adjustable Rate Mortgages(ARMs) meant for ADCo purpose, whose reference currency is always US Dollar. Select the required IRC.
5. Click Apply.

33.2.1.5 Transaction Strategies

Define Other Mortgage Attributes: This tab is available only if the user has an ADCo License.

For more information, see Transaction Strategies, on page 527.

33.2.1.6 BSP Processing

Creating a Static Deterministic Process rule:

In the Audit block, there is a check box called Output ADCO Prepayment SMM rates. Selecting this check box is an optional step.

Output ADCO Prepayment SMM rates: This check box is enabled only if the user has an ADCo Licensee. Check this box to capture the SMM rates for each scenario, As of Date, instrument, Product Leaf, Remaining Term, and the Process ID. On every rerun of the same process ID, a new set of SMM rates at scenario level is written to the audit table fsi_o_smm_rates_audit after deleting the existing records for the process ID. On selective reprocessing of the same process ID, the audit table is truncated and the new set of rates is written to the table.

33.2.1.7 Error Scenarios

- BSP Engine logs error messages into FSI_PROCESS_ERRORS if the ADCo method is assigned to a non Mortgage and processes the next record. This validation check is based on the instrument type.
- BSP Engine logs warning messages into FSI_PROCESS_ERRORS if the input parameters required are missing from the Mortgages table
- BSP engine logs error messages into FSI_PROCESS_ERRORS if forecast rates scenario definitions are inconsistent or the definition is missing. Say, if the rule has 10 scenarios and the ADCo curves are forecast for only 9 scenarios, then a warning message is logged. No warning messages are written if National HPI is not forecasted.

33.2.1.8 CD/MLS Tables Included for ADCo

The following are the CD/MLS tables included for ADCo:

S.No.	TABLE_NAME	DISPLAY_NAME	DESCRIPTION
1	FSI_DELINQUENCY_STATUS_CD	Delinquency Status Cd	Holds Data For Delinquency Status Cd
2	FSI_DELINQUEN_STATUS_MLS	Delinquency Status Mls	Holds Data For Delinquency Status Mls
3	FSI_DOCUMENTATION_CD	Documentation Cd	Holds Data For Documentation Cd
4	FSI_DOCUMENTATION_MLS	Documentation Mls	Holds Data For Documentation Mls
5	FSI_GEOGRAPHIC_LOC_STATE_CD	Geographic State Cd	Holds Data For Geographic State Cd
6	FSI_GEOGRAPHIC_LOC_STATE_MLS	Geographic State Mls	Holds Data For Geographic State Mls
7	FSI_ISSUER_CD	Issuer	Holds Data for Issuer Cd
8	FSI_PPMT_MODEL_INDICES_CD	Ppmt Model Indices Cd	Holds Data For Prepayment Model Indices Cd

S.No.	TABLE_NAME	DISPLAY_NAME	DESCRIPTION
9	FSI_LOAN_TYPE_CD	Loan Type Cd	Holds Data For Loan Type Cd
10	FSI_LOAN_TYPE_MLS	Loan Type Mls	Holds Data For Loan Type Mls
11	FSI_O_SMM_RATES_AUDIT	Single Monthly Mortality Rate Audit Table	Single Monthly Mortality rate audit
12	FSI_PPMT_MODEL_INDICES_MLS	Ppmt Model Indices Mls	Holds Data For Prepayment Model Indices Mls
13	FSI_PREV_DELQ_STATUS_CD	Prev Delq Status Cd	Holds Data For Previous Delinquency Status Cd
14	FSI_PREV_DELQ_STATUS_MLS	Prev Delq Status Mls	Holds Data For Previous Delinquency Status Mls
15	FSI_PROPERTY_PURPOSE_CD	Property Purpose Cd	Holds Data For Property Purpose Cd
16	FSI_PROPERTY_PURPOSE_MLS	Property Purpose Mls	Holds Data For Property Purpose Mls
17	FSI_PROPERTY_SUB_TYPE_CD	Property Sub Type Cd	Holds Data For Property Sub Type Cd
18	FSI_PROPERTY_SUB_TYPE_MLS	Property Sub Type Mls	Holds Data For Property Sub Type Mls
19	FSI_PURPOSE_CD	Purpose Cd	Holds Data For Purpose Cd
20	FSI_PURPOSE_MLS	Purpose Mls	Holds Data for Purpose Mls

33.3 ADCo Mapping

S No	Column Mapped/Used	Input (Adco)
1	CUR_MIN_PMT	CurMinimumPayment
2	LOAN_DOC_STATUS	Documentation
3	FIRST_RESET_AGE	FirstResetAge
4	FIRST_RESET_CAP	FirstResetCap
5	FIRST_RESET_FLOOR	FirstResetFloor
6	PMT_OPTION_FLG	HasOptionalPayment
7	NO_INT_ONLY_MTHS	IOMonths

S No	Column Mapped/Used	Input (Adco)
8	RELO_LOAN_FLG	IsRelo
9	SUB_PRIME_FLG	IsSubprime
10	LIEN_POSITION	LienPosition
11	MORT_INS_CUTOFF	MI_Cutoff
12	MORT_INS_PREMIUM	MI_Premium
13	MORT_INS_AMT	MIAmount
14	NO_LAST_DELQ_MTHS	MonthsSinceLastDelinquency
15	NO_PROPERTY_UNITS	NumUnits
16	ORG_CUST_LTV	OrigCombinedLTV
17	RATE_INCR_CYCLE	PeriodicCap
18	RATE_DECR_CYCLE	PeriodicFloor
19	NO_PREPAY_PENALTY_MTHS	PPMonths
20	PREV_DELQ_STATUS_CD	PreviousDelinquency
21	GEOGRAPHIC_LOC_STATE_CD	State
22	CUR_LOAN_TO_VALUE	Cur_LTV
23	PREPAY_INDEX	Index
24	JOINING_SCORE	Credit_Score
25	CUR_PAR_BAL	Cur_Face
26	FICO_SCORE	CurFICO
27	MARGIN_GROSS	GrossMargin
28	RATE_CAP_LIFE	LifeCap
29	RATE_FLOOR_LIFE	LifeFloor
30	PURPOSE_CD	Loan_Purpose
31	NEG_AMRT_LIMIT	MaxNegAm
32	REPRICE_FREQ	MonthsBetweenReset
33	PROP_PURPOSE_CD	Occupancy
34	ORG_NET_PAR_BAL_C	Orig_Face
35	ORG_LOAN_TO_VALUE	Original_LTV
36	ORG_TERM	OriginalTerm
37	PMT_INCR_CYCLE	PayCap
38	PROP_SUB_TYPE_CD	Property_Type
39	MATURITY_DATE, AS_OF_DATE	RemainingTerm
40	CUR_GROSS_RATE	StartingWac

S No	Column Mapped/Used	Input (Adco)
41	adjustable_type_cd	WacIsFixed
42	PROPERTY_ZIP_CODE	ZipCode
43	NO_BALLOON_MTHS	BalloonMonths
44	FIRST_FORECAST_MTH	FirstForecastMonth
45	FIRST_FORECAST_YR	FirstForecastYear
46	AGE_ON_BOOK	Age
47	RATE_SET_LAG	LookBackMonths
48	ORG_RATE	WAC

33.4 Limitations

Support for Adco when using FTP forecasting methods is not currently supported and will be available when the FTP application supports Adco.

34 Moody's WSA Integration

Moody's Analytics has a model - WSA libraries, which generate structured security cash flows. This functionality is required to support the modeling of structured products (ABS/MBS CMO's, and CDO's). In OFSAA BSP, this integration is necessary for modeling structured product cash flows of a given tranche of security. These cash flows cannot be modeled in the OFSAA CFE because of the nature of the rules in the waterfall of cash flows.

For example, a structured security is backed by a pool of loans, and these loans pay principle and interest but the certainty of cash flows is not known because of prepayment and loss activity within a specified loan pool. These monthly cash flows are run through the waterfall rule within the securitization and only then are the individual tranche cash flows derived. The moody's cash flow model will output these specific tranche cash flows under given input assumptions, and OFSAA will uptake these cash flows into the BSP processing. The input assumption information is passed to the Moody's model, so their model will produce cash flows for a given tranche of security (such as interest and principal), and the model results will be imported into our deterministic cash flow results (Detail cash flows, Result Detail, Result Master Cons Detail and Cons Master).

Before using Moody's cashflow libraries in OFSAA BSP, Users must procure a license to the WSA libraries from Moody's Analytics.

34.1 Deployment of Moody Libraries on OFSAAI

The following are the prerequisites to deploy Moody libraries on OFSAAI:

- BSP 8.0
- A license for the WSA libraries is required from Moody's

34.1.1 Steps to Deploy Moody Libraries on OFSAAI

- Preparation

1. Log in to the UNIX Profile where the OFSAAI database tier is installed.
2. Create a folder called “moody”; create 2 sub-folders under “moody”: ”data”, “lib64”.
3. Edit the .profile script and set the following environment variables:
   - MOODYS_DATA_PATH: Set it to the absolute path of the “data” sub-folder created above
   - LD_LIBRARY_PATH: Update this environment variable to include the absolute path of the “lib64” sub-folder created above
   - ADCO_DATA_PATH: Set it to the absolute path where ADCo historical-rate files are present.

   NOTE This is only required if you are using Moody's libraries along with the ADCo prepayment model. For more information on the Adco LDM prepayment model, see the chapter Andrew Davidson and Company (ADCo) Prepayment Method.
4. Stop all OFSAAI services.

5. Log out of the UNIX Session and log back into UNIX. Verify that the 2 environment variables created above are set properly.
6. Start all OFSAAI Services.
   a. Deployment:
      i. Download the Moody libraries and place the files into the “moody/lib64” sub-folder.
      ii. Place the deal files in the “Moody's Data” folder.
   b. Enable Moody functionality in BSP
      i. Login to OFSAAI as the SYSADMN.
      ii. Under the OFSAAI Home Page, go to Administration -> Security Management.
      iii. Expand System Administrator and click “Function – Role Map”.
      iv. Associate the SMS-Function “'Moody Integration for BSP'” with the required roles to the required user name.

34.2 Moody's Integration – Considerations

34.2.1.1 WSA Engine and Processing of the Records

- Moody's WSA Engine requires CUSIP or Deal-Id/Tranche (Bond) Id for processing the instruments. Depending on the Forecast Scenario and the behavior assumptions, the WSA engine will process the records and output the respective cash flows for various scenarios.
- Moody's provides the cash flows only at the tranche balance, Users should populate the balance of their position in the appropriate column, and the cash flows from Moody's would be scaled to the balance provided. This happens within the OFSAA BSP engine.
- If the user has Moody's installed, only securitized products (supported by Moody's) should be populated in the FSI_D_ASSET_BACK_SEC (or the table classification code for securitized products). Other records if populated in this table would not be processing. For example: If the user populates loans and securitized products in the FSI_D_ASSET_BACK_SEC table, the loan records would not be processed in the table.
- OFSAA BSP also writes back instrument attributes such as agency_type, Asset_type, Original balance of the tranche, current balance of the tranche, coupon, stated maturity, periodicity, and so on for an upstream system to use, if needed.

34.2.2 WSA Engine and OFSAA Rate Management

Interest Rate Curves required for Moody's should be set up through the Curve Identifier drop-down list in the Rate Management IRC UI. Moody's requires the following curves to be defined:

- LIBOR (Zero-Coupon LIBOR/Swap)
- TREASURY CURVE (Zero-Coupon Treasury)
- COFI (Cost of Funds Index)
- PRIME (Prime Lending Rate)

It's the user's responsibility to set up the proper curves while using Moody's libraries. Users can define only one treasury curve / one LIBOR curve / one COFI curve and one prime curve per currency.

> **NOTE** A majority of the deals would be based on LIBOR/Treasury Curves.

34.2.3 WSA Engine and OFSAA Product Characteristic Definition

A New tab "Model Integration" is introduced for Moody's WSA Integration. This tab is enabled only for the account types "Structured Products - Assets" "Structured Products - Liabilities".

Model Selection, Tuning, and tuning parameters for the selected model can be passed through the Model Integration in Product Characteristic UI.

Users should logically branch the deals (RMBS, CMBS, SLABS, Credit Cards) in their hierarchy for modeling the behavior in the following two ways. Details follow:

- Passing the assumptions from a table: The user can choose to pass the following assumptions (listed in the table below) through the table "FSI_D_BEHAVIOR_ASSUMPTIONS". These would be read from the table and applied to the deal with the matching "INSTRUMENT_NUM" in the instrument table. In the model selection UI, the user has to select "Source system provided" against the particular node for modeling with the user provided assumptions.

  Assumption Types/Subtype Details:

ASSUMPTION TYPE	ASSUMPTION SUBTYPE	DESCRIPTION
PREPAYMENT	PREPAY_CURVE_PSA	Standard prepayment curve measuring for prepayments in the residential mortgage market.
PREPAYMENT	PREPAY_CURVE_SMM	Monthly prepayment or default rate.
PREPAYMENT	PREPAY_CURVE_CPR	Constant Prepayment Rate (CPR): Prepayment percentage expressed as an annual compounded rate.
PREPAYMENT	PREPAY_CURVE_HEP	Home Equity Prepayment: A measure of prepayments for closed-end, fixed-rate HEL loans. This curve accounts for the faster seasoning ramp for home equity loans.
PREPAYMENT	PREPAY_CURVE_ABS	Asset-Backed Securities (ABS): It is used in ABS markets, where prepayments differ significantly from standard mortgages. This model defines an increasing sequence of monthly prepayment rates, which correspond to a constant absolute level of loan prepayments in all future periods.
DEFAULT	DEFAULT_CURVE_CDR	Constant Default Rate (CDR): Default percentage expressed as an annual compounded rate
DEFAULT	DEFAULT_CURVE_SDA	Standard default curve: Measuring for defaults in the residential mortgage market
DEFAULT	DEFAULT_CURVE_MDR	Monthly Default Rate

ASSUMPTION TYPE	ASSUMPTION SUBTYPE	DESCRIPTION
DEFAULT	DEFAULT_CURVE_SEASONED_CDR	
DEFAULT	DEFAULT_CURVE_SEASONED_MDR	
DELINQUENCY	dq30Val	A pointer to data for from 30 to 59 day's delinquency
DELINQUENCY	dq60Val	A pointer to data for from 60 to 89 day's delinquency
DELINQUENCY	dq90Val	A pointer to data for 90 plus day's delinquency
RECOVERIES	RECOVERY	Vector of recoveries
DRAW	HELOC_DRAW_RATES	Vector of annualized draw rates for HELOC
FORBEARANCE	FORBEARANCE	Sets the constant or vectored forbearance rate for SLABS deals
DEFERMENT	STUDENT_LOAN_REPAY_TYPE_FULL_DEFER	Capitalize Interest
DEFERMENT	STUDENT_LOAN_REPAY_TYPE_PRIN_DEFER	Pay Interest, Balance Flat
CREDIT_CARDS	CREDIT_CARD_ASSUMP_YIELD	Portfolio/Annual Yield
CREDIT_CARDS	CREDIT_CARD_ASSUMP_REPAYMENT	Repayment Rate
CREDIT_CARDS	CREDIT_CARD_ASSUMP_RECOVERY	Loss Rate
CREDIT_CARDS	CREDIT_CARD_ASSUMP_PURCHASE	Purchase Rate
CREDIT_CARDS	CREDIT_CARD_ASSUMP_DEFAULT	Default Rate

  - When a user is passing assumptions, for example, the Prepayment vector, the subtype values can be in; – PSA, SMM, CPR, HEP, and ABS. Users have to make sure they are passing the correct and acceptable subtype with respect to Moody's. Only one subtype can be applied for prepayment and default per each CUSIP.
  - When passing the delinquency assumptions, the dq30val, dq60Val, and dq90Val mentioned for are not subtypes; rather they are various levels of delinquencies possible. Typically a deal would have all three vectors available.

- ADCo prepayment and default modeling: The user can also choose to model through the ADCo model by selecting “ADCo” in the model selection drop-down list. ADCo can only be used against RMBS deals, as ADCo can only model Mortgage-Backed Securities.

Tuning Parameters:

Tuning is available to allow the user to customize the assumptions being provided to Moody's WSA engine.

- For Source System Provided:

Tuning Parameter	Description	Default Value
Prepayment	The magnitude for prepaying rate	1
Default	The magnitude for the default rate	1
Recovery	The magnitude for the recovery rate	1
Recovery Lag	Recovery lag applied to each loan	0
Draw Rates	The magnitude for mortgage draw rates	1
Servicer Advancing	NONE/INTEREST/BOTH	None

- For ADCO:

  Additionally, the Parameters available are:

Tuning Parameters	Description	Default
ficoToUseIfNotAvailable	Fico to use for loans that do not have this INFO	680
ficoSubprimeThreashold	The loan is considered subprime if FICO is less than this value (620 if not provided)	620
SMM for Failed Loans	SMM for Failed Loans	NA
Recovery for Failed Loans	Recovery for Failed Loans	NA
MDR for Failed Loans	MDR for Failed Loans	NA

34.3 Setting up a Moody's Process

The steps to set up a Moody process, follow these steps:

1. Mapping of the Moody's function to the BSP user
2. Set up the curves needed for Moody's WSA libraries, with the respective curve identifier.
3. Load the STG_INVESTMENTS and STG_INSTRUMENT_CONTRACT_MASTER tables.
4. Run the T2T batch to populate the FSI_D_ASSET_BACK_SEC table
5. Define the Model Integration rule in the Product Characteristic UI for the leaf nodes in the member hierarchy
6. Define the Forecast Rate rules and the discount methods - only required for valuation. (For more details on ADCo 360 Bucket forecasting, see the chapter Forecast Rate Scenarios.)

7. Setup the Static/dynamic deterministic Process including the rules defined above (Prod Char, Forecast Rates, and Discount methods). (Note: New Business is not supported for Securitized products)
8. Select the structured product output flag (optional) to update the instrument records
9. Execute the Process.

34.4 Limitations

- New business not supported for Dynamic Deterministic processing.
- WSA libraries are only available on Linux Operating Systems (5 &6)

35 Appendix A: Process Tuning

This module provides information on configuring the Oracle Financial Services Analytical Application (OFSAA) server-centric software for multiprocessing through the Process Tuning UI.

> **NOTE** This appendix is shared with other OFS applications including Funds Transfer Pricing and Asset Liability Management. OFS Balance Sheet Planning and OFS Asset Liability Management share the same OFSAA server-centric software (cash flow engine) for deterministic processing. Within this appendix, all references to static deterministic multiprocessing for Asset Liability Management processes apply equally to Balance Sheet Planning processes.

> **ATTENTION** The Process Tuning UI is available for definition ONLY for a User who has a role mapping that of 'Administrator' or 'Auditor'. The 'Auditor' role mapped user has 'READ-ONLY' access to Process Tuning UI.

This appendix covers the following topics:

- Multiprocessing Model
- Multiprocessing Options
- Specifying Multiprocessing Parameters
- Tuning Multiprocessing

For more information on OFSAA Process Tuning Options, see the Doc ID 1307766.1

35.1.1 Multiprocessing Model

By default, multiprocessing is disabled for all applications. Multiprocessing is enabled by setting application-specific parameters located under the Common Object Maintenance > Process Tuning. The following applications and features have multiprocessing settings:

- Asset Liability Management – Deterministic and Stochastic Processing
- Balance Sheet Planning – Deterministic Processing
- Funds Transfer Pricing – Standard and Stochastic Processing

> **NOTE** BSP does not support Stochastic Processing.

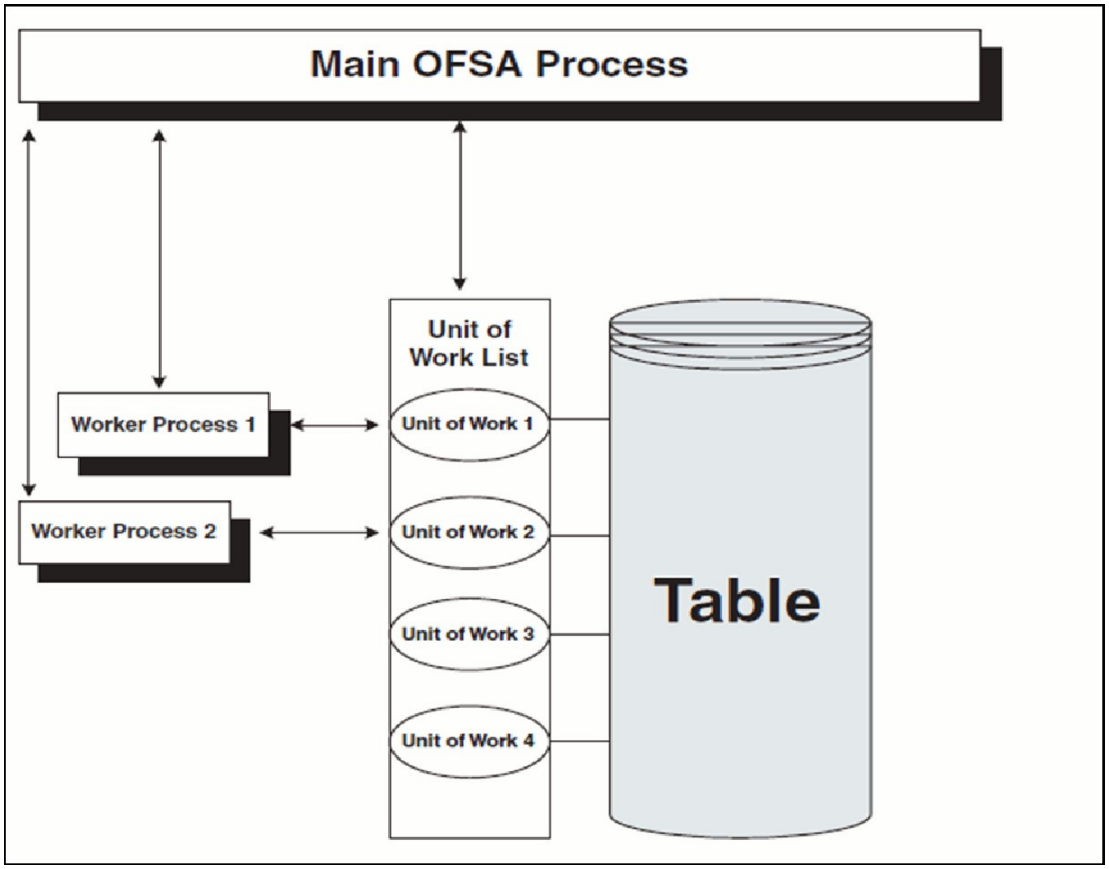
OFSAA multiprocessing is based on the concept of a unit of work. A unit of work is a set of rows from the database. A single OFSAA process becomes multiple processes by dividing the single process according to distinct sets of rows. Units of work are distributed to worker processes until all processes

have been completed. To achieve multiple parallel processes, the following options must be configured:

- Creating a list or lists of units of work
- Defining the number of worker processes to service the units-of-work lists
- Defining how the worker processes service the unit-of-work lists

The specifics of each option are discussed. The following diagram illustrates the basic multiprocessing principles:

Figure 247: Main OFSAA Process



1. The main process makes a list of all units of work that must be processed.
2. The main process spawns worker processes. Each worker process is assigned a unit of work by the main process.
3. When all units of work have been completed, the worker process exits and the main process finishes any clean-up aspects of processing.
4. During processing the following is true:
   - Each worker process must form its own database connection.
   - A unit of work is processed only by a single worker process.
   - Different units of work are processed at the same time by different worker processes.

> **NOTE** If data is not distributed well across physical devices, I/O contention may offset the advantage of parallelism within OFSAA for I/O bound processing. It is recommended that users choose a dimension or combination of dimensions that produce a relatively equal distribution of data records.

35.1.2 Multiprocessing Options

The Multiprocessing Options are the settings and parameters that control how individual ALM or FTP Processes are processed by the Cash Flow engine. The seeded data model includes default settings for all of the multiprocessing options, but you can also customize the settings for your own use. This section describes the different Multiprocessing options as well as how to customize each. These options are:

- Units of Work
- Unit-of-Work Servicing
- Worker Processes

Units of Work

The OFSAA processing engines determine units of work for any job based upon the Process Data Slicing Code assignment. The Data Slicing Code comprises one or more columns by which data in the (processing) table is segmented. The individual segments are the defined Units of Work.

The Process Tuning user interface enables you to specify different unit-of-work definitions for your processes. You could specify one unit-of-work definition for one set of processes and then specify a different unit-of-work definition for another set of processes.

The OFSAA Processing Engines determine the units of work for a job by executing the following statement (with filtering criteria applied) on every table the process is run against:

select distinct<data slice columns>from<table>where<filter condition>;

where <data slice columns>is the comma-separated list of columns used for data slicing, <table>is the name of the instrument table being processed, and <filter condition>is the additional filter (if any) for the process. All portfolio tables with numeric columns will be used for Data slicing.

Default Unit-of-Work Definitions

OFSAA provides three default unit-of-work definitions:

Table 40: Default Unit-of-Work Definitions

PROCESS_DATA_SLICES_CD	PROCESS_DATA_SLICES_SEQ	COLUMN_NAME
1	1	ORG_UNIT_ID
1	2	COMMON_COA_ID
2	1	ORG_UNIT_ID
3	1	COMMON_COA_ID

Any single Process Data Slice Code can comprise multiple columns. As an example of this, the PROCESS_DATA_SLICES_CD = 1 comprises both ORG_UNIT_ID and COMMON_COA_ID. The PROCESS_DATA_SLICES_SEQ identifies the precedence for the columns within the Process Data Slices CD.

Unit-of-Work Servicing

Unit-of-work servicing identifies how the OFSAA processing engines interact with Oracle Database Table Partitioning.

What is Partitioning

Partitioning addresses the key problem of supporting very large tables and indexes by enabling you to decompose them into smaller and more manageable pieces called partitions. Once partitions are defined, SQL statements can access and manipulate the partitions rather than entire tables or indexes. Partitions are especially useful in data warehouse applications, which commonly store and analyze large amounts of historical data.

What Is Unit-of-Work Servicing?

Unit-of-work servicing specifies how individual units of work are processed for a table that is partitioned.

For a partitioned table, an application Rule Type/ Rule Step can create multiple units-of-work lists by executing the following statement (with filtering criteria applied) on every table partition the process is run against:

select distinct<data slice columns>from<table_partition_n>

For example,

SELECT DISTINCT REV.COLUMN_NAME, MLS.DISPLAY_NAME from REV_TAB_COLUMNS REV, REV_TAB_COLUMNS_MLS MLS

WHERE REV.TABLE_NAME=MLS.TABLE_NAME AND REV.COLUMN_NAME=MLS.COLUMN_NAME

AND REV.TABLE_NAME='PORTFOLIO' AND REV.DATA_TYPE='NUMBER' AND MLS.MLS_CD='US'

UNION SELECT 'DATA_SLICE_ID' COLUMN_NAME,'Data Slice' DISPLAY_NAME from DUAL

UNION SELECT 'FINANCIAL_ELEM_ID' COLUMN_NAME,'Financial Element' DISPLAY_NAME from DUAL ORDER BY DISPLAY_NAME;

where <data slice columns>is the comma-separated list of columns used for data slicing. Any column in a table can be used for data slicing. <table_partition_n> are the unique table partitions of a table where n is assumed to be greater than 1.

The different Servicing methodologies are stored in the FSI_PROCESS_PARTITION_CD and FSI_PROCESS_PARTITION_MLS tables. You cannot add any customized Servicing methodologies. The Servicing methodologies provided in OFSAA are as follows:

Table 41: Servicing Methodologies

PROCESS_PARTITION_CD	PROCESS_PARTITION
0	Do not use partitions (single servicing)
1	Use shared partitions (Cooperative Servicing)
2	Use non-shared partitions (Dedicated Servicing)

These methodologies are defined as follows:

- Single Servicing
- Cooperative Servicing
- Dedicated Servicing

Single Servicing

Single Servicing indicates that the OFSAA processing engine fulfills unit-of-work requests regardless of any table partitioning. As each individual process completes, it requests the next unit-of-work segment, whether or not that segment belongs in the same Table partition.

Use Single Servicing when you do not have Oracle Table Partitioning in your database.

Cooperative Servicing

Cooperative Servicing indicates that the OFSAA processing engine fulfills unit-of-work requests so that each process works against a specific partition unless it is idle. Idle processes then work against the next available unit-of-work segment, whether or not that segment belongs in the same Table partition.

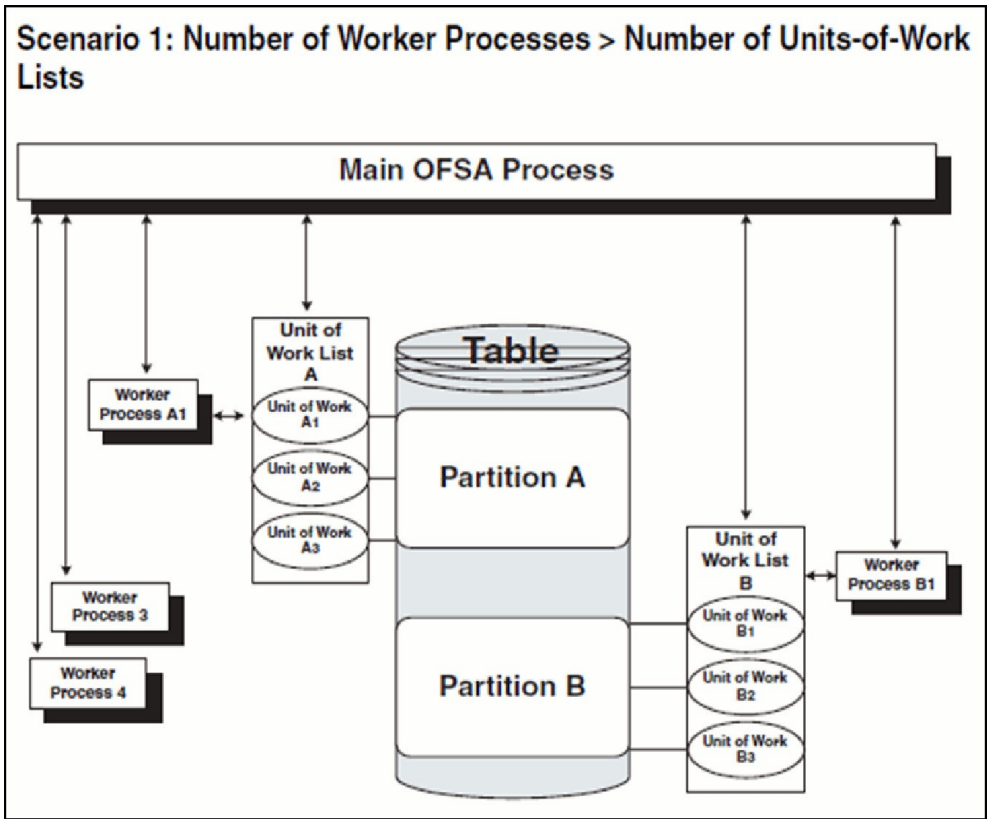
Dedicated Servicing

Dedicated Servicing indicates that the OFSAA processing engine fulfills unit-of-work requests so that each process works against a specific partition.

Examples of How Worker Processes Service Units of Work

FSI_PROCESS_ID_STEP_RUN_OPT.PROCESS_PARTITION_CD defines how Worker Processes service the units-of-work list or lists. As explained in the define units-of-work list or lists step, an FSI_PROCESS_ID_STEP_RUN_OPT.PROCESS_PARTITION_CD equal to 0 results in a single units-of-work list. With a single units-of-work list, all available worker processes service the list until all units of work are complete. When FSI _PROCESS_ID_STEP_RUN_OPT.PROCESS_PARTITION_CD equals 1 or 2 and the table to be processed is partitioned, multiple units of work lists are created. The following scenarios explain how the worker processes service multiple units-of-work lists:

Figure 248: Scenario 1: Number of Worker Processes > Number of Units-of-Work Lists



- The main process makes two lists of all units of work that need to be processed, unit-of-work list A and unit-of-work list B, respectively. (The setup is that the Table has two partitions.)
- The main process spawns four worker processes. A dedicated worker process is assigned to service each units-of-work list, Worker Process A1 and Worker Process B1 respectively. (The setup is (FSI_PROCESS_ID_STEP_RUN_OPT.NUM_OF_PROCESSES = 4)

  If FSI_PROCESS_ID_STEP_RUN_OPT.PROCESS_PARTITION_CD equals 1, Worker Process 3 and Worker Process 4 assist Worker Process A1. When a unit-of-work list is complete, the available worker processes assist dedicated worker process on their unit-of-work List.

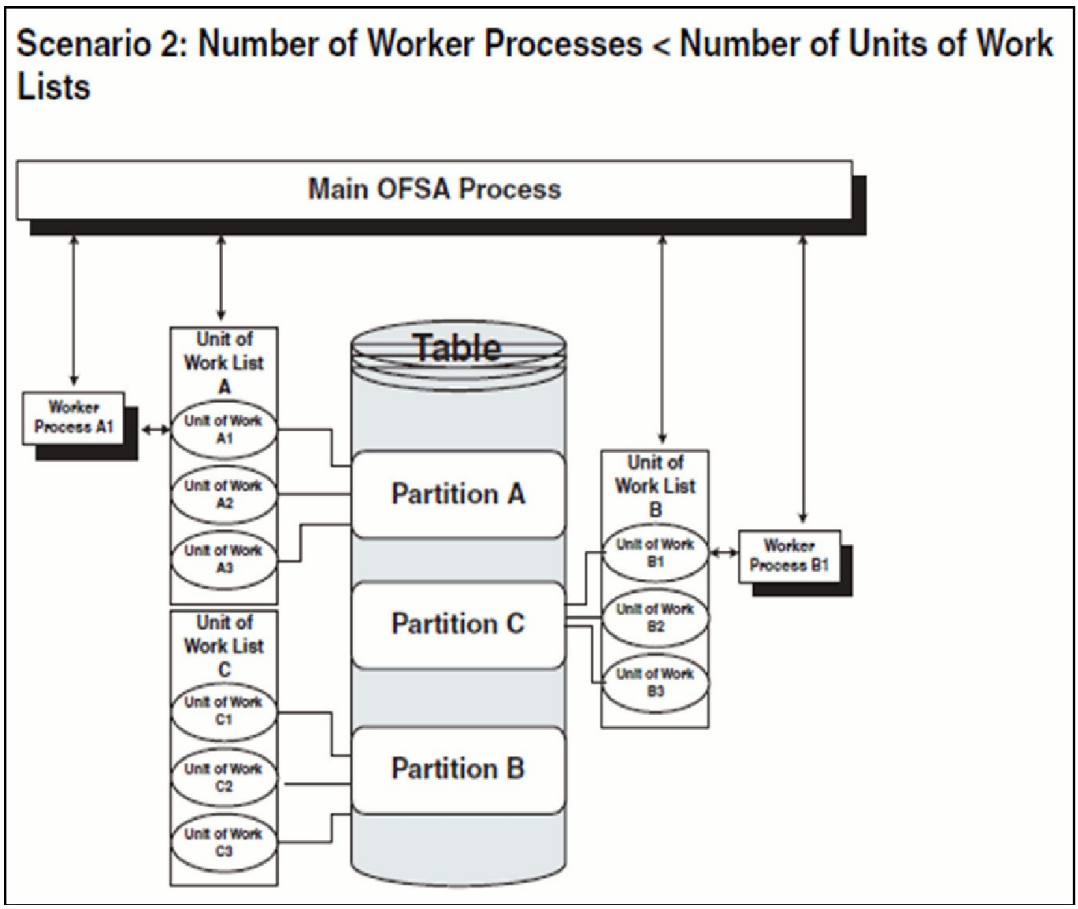
  If FSI_PROCESS_ID_STEP_RUN_OPT.PROCESS_PARTITION_CD equals 2, Worker Process 3 and Worker Process 4 do not assist the dedicated worker processes
- When all units of work have been completed, the worker process exits and the main process finishes any clean-up aspects of processing.
- During processing the following is true:

  Each worker process must form its own database connection.

  A unit of work is processed only by a single worker process

  Different units of work are processed at the same time by different worker processes.

Figure 249: Scenario 2: Number of Worker Processes < Number of Units-of-Work Lists



- The main process makes three lists of all units of work that need to be processed: unit-of-work list A, unit-of-work list B, and unit-of-work list C, respectively. (The setup is that the Table has three partitions.)
- The main process spawns two worker processes. A dedicated worker process is assigned to service a units-of-work list, Worker Process A1 and Worker Process B1 respectively. (The setup is (FSI_PROCESS_ID_STEP_RUN_OPT.NUM_OF_PROCESSES = 2).

  If FSI_PROCESS_ID_STEP_RUN_OPT.PROCESS_PARTITION_CD equals 1, Worker Process A1 and Worker Process B1 work until all units of work are complete from all three unit-of-work lists.

  If FSI_PROCESS_ID_STEP_RUN_OPT.PROCESS_PARTITION_CD equals 2, the first worker process to complete their unit-of-work List services unit-of-work list C. When the other worker process completes their list, the worker process exits.
- When all units of work have been completed, the worker process exits and the main process finishes any clean-up aspects of processing.
- During processing the following is true:

  Each worker process must form its own database connection.

  A unit of work is processed only by a single worker process.

  Different units of work are processed at the same time by different worker processes.

Worker Processes

Worker Processes refer to the number of individual processes working simultaneously to complete the job. The Main OFSAA Process launches the individual worker processes. OFSAA enables you to specify the number of worker processes for your jobs.

35.1.3 Specifying Multiprocessing Parameters

Users can access the multi-processing / tuning UI under the Common Object Maintenance on the LHS menu.

The application installation process seeds default multiprocessing parameters. By default, multiprocessing is turned off for all processes. To turn on multiprocessing, Application Administrators can define Process tuning assumptions at the application level or for individual processes.

This section discusses the following topics:

- Multiprocessing Assignment Levels
- Defining Multiprocessing
- Engine Overrides

Multiprocessing Assignment Levels

Multiprocessing parameters can be specified at different levels. A Multiprocessing Assignment Level is the category of ALM or FTP execution that is processed with a designated set of multiprocessing parameters.

OFSAA provides multiprocessing assignments at the following levels:

- Rule Type
- Rule Step
- Rule Name

Rule Type

When specifying multiprocessing parameters at the Rule Type level, all Rule Names for that Rule Type are processed with the designated parameters.

The OFSAA multiprocessing UI allows you to designate a set of multiprocessing parameters used for a specific Rule step within a given Rule Type.

> **NOTE** BSP uses PROCESS_ENGINE_CD = 2 (that is, BSP uses the Asset Liability Management rule type).

The valid Rule Type values present in the 'Rule Type' drop-down list are:

Table 42: Rule Type Values

FSI_PROCESS_ENGINE_CD		
PROCESS_ENGINE_CD	DESCRIPTION	RULE TYPE
2	Asset | Liability Management Process	Asset | Liability Management
3	Funds Transfer Pricing Process	Funds Transfer Pricing

The OFSAA multiprocessing UI allows you to designate a set of multiprocessing parameters used for a specific Rule step within a given Rule Type.

Rule Step

The Rule Step identifies a particular phase of an OFSAA process. Rule Steps are reserved names specific to each Rule Type.

Each Rule Step Name applies to a specific Rule Type.

The mapping of the list of valid Rule Steps and the Rule Type for which they apply is as follows:

Table 43: Mapping of the List of Valid Rule Steps and Rule Type

PROCESS_ENGINE_CD	RULE STEP NAME
0	ALL
2	Client Data by Prod
2	Client Data by Prod, Org
2	Client Data by Prod, Currency
2	Monte Carlo client data
3	ALL

Figure 250: Process Tuning Options Summary

Rule Name

Users can optionally specify multiprocessing parameters at the Rule Name level to override any parameters assigned at the Rule Type level. This enables you to individualize your multiprocessing options to handle situations unique to specific Processes. In most cases, defining multi-process assumptions at the Application / Rule Step level is sufficient.

The list of valid Rule Names is populated from the FSI_M_OBJECT_DEFINITION_B and FSI_M_OBJECT_DEFINITION_TL tables.

Only Rule Names of the following Process types are available for multi-processing:

- Asset | Liability Management Process
- Funds Transfer Pricing Process

Defining Multiprocessing

The process of defining Multiprocessing involves associating multiprocessing parameters to OFSAA Rule Types and/or Rule Names. Included in this section are the following topics:

- Parameter Tables
- How to Specify Parameters

Parameter Tables

While defining multiprocessing, the user interface inserts data into the following objects:

FSI_PROCESS_ID_RUN_OPTIONS

FSI_PROCESS_ID_STEP_RUN_OPT

FSI_PROCESS_ID_RUN_OPTIONS_V (Read Only View)

Table 44: Table Names, Display Names and Descriptions for Multiprocessing

TABLE_NAME	DISPLAY_NAME	DESCRIPTION
FSI_PROCESS_ID_RUN_OPTIONS	Process ID Run Options	This table specifies the Rule Name (ALM Process / FTP Process) for a single Process Type.
FSI_PROCESS_ID_STEP_RUN_OPT	Process ID Step Run Options	This table stores the Process Tuning Definition and contains the Rule Name (ALM Process / FTP Process) and process tuning option selections.
FSI_PROCESS_ID_RUN_OPTIONS_V	Process ID Run Options View	This table provides a read-only view based on FSI_PROCESS_ID_RUN_OPTIONS and FSI_PROCESS_ID_STEP_RUN_OPT tables.

Each table is described as follows:

FSI_PROCESS_ID_RUN_OPTIONS

Table 45: FSI_PROCESS_ID_RUN_OPTIONS Table Column Name, Description, and Display Name

COLUMN_NAME	DESCRIPTION	Display Name
PROCESS_RUN_OPTION_SYS_ID	Rule Name (ALM Process / FTP Process) System ID Number	System ID Number
PROCESS_ENGINE_CD	Process Engine Code that run this Rule Name (ALM Process / FTP Process)	Process Engine Code

FSI_PROCESS_ID_STEP_RUN_OPT

Table 46: FSI_PROCESS_ID_STEP_RUN_OPT Table Column Name, Description, and Display Name

COLUMN_NAME	DESCRIPTION	Display Name
PROCESS_STEP_RUN_SYS_ID	This stores the Rule Name's (ALM Process / FTP Process) System ID Number.	System ID Number
PROCESS_ENGINE_STEP_CD	Rule Step of the Rule Name getting the Process Data Slices Code and Process Partition Code	Step Name
NUM_OF_PROCESSES	Number of Processes	Number of Processes
COMMIT_FREQ	The number of rows after which the process commits changes.	Commit Frequency
ARRAY_SIZE_ROWS	The number of rows updated in a single call to the database.	Array Size Rows
PROCESS_PARTITION_CD	Process Partition code used by this Rule Name (ALM Process / FTP Process) in this step	Process Partition Code
PROCESS_DATA_SLICES_CD	Process Data Slices Code used by this Rule Name (ALM Process / FTP Process) in this step	Process Data Slices Code
PROCESS_ENGINE_CD	Process Engine Code that run this Rule Name (ALM Process / FTP Process)	Process Engine Code

FSI_PROCESS_ID_RUN_OPTIONS_V

Table 47: FSI_PROCESS_ID_RUN_OPTIONS_V Table Column Name, Description, and Display Name

COLUMN_NAME	DESCRIPTION	Display Name
SYS_ID_NUM	Rule Name (ALM Process / FTP Process) System ID Number	System ID Number
STEP_NAME	Rule Step of the Rule Name getting the Process Data Slices Code and Process Partition Code	Step Name
PROCESS_ENGINE_CD	Process Engine Code that run this Rule Name (ALM Process / FTP Process)	Process Engine Code
NUM_OF_PROCESSES	Number of Processes	Number of Processes
PROCESS_DATA_SLICES_CD	Process Data Slices Code used by this Rule Name (ALM Process / FTP Process) in this step	Process Data Slices Code
PROCESS_PARTITION_CD	Process Partition code used by this Rule Name (ALM Process / FTP Process) in this step	Process Partition Code
COMMIT_FREQ	The number of rows after which the process commits changes.	Commit Frequency
ARRAY_SIZE_ROWS	The number of rows updated in a single call to the database.	Array Size Rows

How to Specify Parameters

The setup of multiprocessing is broken down into the following steps:

- Assignment Level Details
- Parameter Specification
- Multi-Processing Options
- Assign Unit-of-Work Servicing Methodology

For each step, the relevant multiprocessing parameters are described. Some applications override the multiprocessing configuration to handle special processing conditions. The Engine Overrides section explains these special processing conditions.

Assignment Level Details

The 'Rule Type', 'Rule Step', and 'Rule Name' columns identify the Assignment Level for multiprocessing.

Procedure:

1. Log on to Financial Services Applications with the User ID/password that has 'Administrator' Privileges.
2. Navigate to Common Object Maintenance > Process Tuning Options Summary Page. This page is the gateway to Process Tuning Options-related functionality.

3. Click Add to create a new Process Tuning assumption. Note, you can create only one process tuning assumption per combination of Rule Type and Rule Name.
4. The Process Tuning Options Summary – Create page is displayed.
5. Step - 1: Assignment Level Details Block is the first block.

Figure 251: Process Tuning Options Summary – Assignment Level Details

6. This block contains 4 fields - Rule Type, Rule Step, Folder Name, and Rule Name.
7. Select the required Rule Type.
8. Folder Name is a drop-down to assist rule-name selection, filtered by selected folder.
9. Select the required Rule Step. Rule Step is a drop-down that is filtered based on its mapping to the Rule Type selected.
10. Select the required Rule Name. Rule Name is a drop-down that displays rules of the selected type, within the specified folder.

The system supports four assignment levels. Because an application allows configurations that mix these levels, it is important to understand the order in which the application resolves the multiprocessing parameters when the configuration mixes assignment levels. The order is:

1. Specific Step of a specific Process for an engine
2. All Steps of a specific Process for an engine
3. Specific Step of all Processes for an engine

The next step after defining Assignment Level details is to define the Multiprocessing Parameters. Multiprocessing parameters include inputs for the following:

Figure 252: Process Tuning Options Summary - Edit

- Partition Type
- Array Row Size
- Number of Processes
- Commit Frequency

The following describes inputs for each parameter:

Partition Type

Partition Type selection is required when table partitioning is being used within your instrument tables. If no partitioning is being done, then the default selection of “No Partitioning” should be selected. If partitioning is being done, then users should select either Dedicated or Cooperative. For more information on these selections, see the section on Multiprocessing Options > Unit of Work servicing.

Number of Processes

The number of processes selection indicates the number of concurrent processes to be launched by the engine. Typically, the number of processes should be less than or equal to the number of CPUs available on the server. Users should experiment with the number of processes setting to find the optimal value.

Array Row Size and Commit Frequency

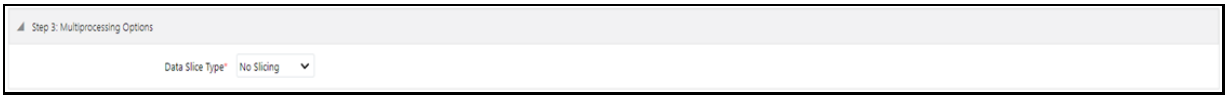
You must do some trials to set these at the optimum level. Commit frequency can be set as 999 and array size rows as 500. Setting the array update size to be greater than the commit frequency does not affect because the array update size is limited by commit frequency.

To use Commit_Freq = 0 Or > 0, below are recommendations:

- If only "Process Cash Flow" writing is applicable as part of the process definition, then use Commit_Freq optimally greater than 0.
- If "Process Cash Flow" is not applicable but output to RES_DTL, CONS_DTL, and so on is done (as part of process definition), then the entry should be set to "0" in case commit is required at UOW (that is Unit of Work) End.
- If both "Process Cash Flow" and output to RES_DTL, CONS_DTL are applicable, then you should set Commit_Freq > 0 to take benefit of the Process Cash Flow Bulk Processing. If commit at the end of UOW is sought, then this setting should be set to "0".

Step 3 in the multiprocessing setup includes the following selections:

Figure 253: Multiprocessing Options



Data slice type

Data Slice Type is a static drop-down with 2 values [Distinct Values, No Slicing]. Users should choose distinct values to enable multiprocessing. After choosing distinct values, users are required to further select their Data Slicing dimensions.

Data slicing dimensions

Choose the edit option to launch a pop-up window to select the slicing columns.

> **NOTE** All portfolio tables with numeric columns will be used for Data slicing, The columns with null values cannot be used for data slicing.

Engine Overrides

For some conditions, the OFSAA Processing Engines override the multiprocessing definition for an assignment level. The overrides are as follows:

Balance Sheet Planning

Balance Sheet Planning configures the data slicing columns automatically using the Product Leaf Column defined in the active Application Preferences as the default slicing column for all runs. The Balance Sheet Planning engine adds more slicing columns based upon the parameters specified in the Balance Sheet Planning Process, as follows:

- If Product/Organizational Unit functional dimensions are selected, the engine adds ORG_UNIT_ID as an additional slicing column.
- If Product/Currency functional dimensions are selected, the engine adds ISO_CURRENCY_CD as an additional slicing column.
- If Product/Organizational/Currency functional dimensions are selected, the engine adds ORG_UNIT_ID and ISO_CURRENCY_CD as additional slicing columns.

35.1.4 Tuning Multiprocessing

Tuning for optimal multiprocessing settings is an exercise similar to tuning a database. It involves experimentation with different settings under different load conditions.

Database Bound versus Engine Bound Jobs

OFSAA jobs fall into the following two categories:

- Database bound—Those jobs that spend more time within database manipulations.
- Engine bound—Those jobs whose calculations are complex, with the time spent with database Operations being small compared to the amount of time doing calculations.

The following table lists OFSAA jobs by Application and identifies whether the job is usually database bound or Engine bound.

Table 48: OFSAA Jobs by Application

Application	Job Type	Generic Job Type	OFSAA / DB Bound	MP Enabled	Comments
Asset | Liability Management	Detail Processing (Current position, Gap, Market Value)	Row by Row	OFSAA	Yes	All processing except Formula Results and Auto Balancing
Asset | Liability Management	Formula Results	Row by Row	OFSAA	No	Formula Results is not currently functional and will be available in a later release
Asset | Liability Management	Auto Balancing	Row by Row	OFSAA	No	

The scalability of database-bound jobs is largely determined by the size of the database server. The scalability of Engine bound jobs is determined by the size of the application server.

Tuning the OFSAA Database from the Application Layer

Despite the many multiprocessing options, tuning the OFSAA database from the application layer is achieved by following a simple process. The process is as follows:

1. Identify the OFSAA job types that are used by your organization.
2. For each job type, time runs for a series of Number of Processes settings, defined in Step 2: Parameter Details.
3. Based on the results, determine the appropriate setting per application.

Special Considerations

Because of the nature of parallel processing performed by OFSAA, different processes tend to need to access the same tables at the same time. Unless care is taken in designing the layout of the database tables, this can lead to I/O contention, which in turn, can reduce scalability.

35.1.5 Recommendations for Performance Improvement

While configuring a BSP process user can choose to output detailed cash flows (either all or part). This data is stored in table FSI_O_PROCESS_CASH_FLOWS. When a process is re-run either for the same As of Date or for a different date existing data of that process is deleted from this table before calculations initiate. When the volume of data is high this can take time thereby impacting overall performance. The following recommendations will help improve this.

1. Create a non-unique index on column RESULT_SYS_ID of table FSI_O_PROCESS_CASH_FLOWS. The index is expected to make DELETE of existing data faster when a process is re-run.
2. FSI_O_PROCESS_CASH_FLOWS can be partitioned by RESULT_SYS_ID. Automatic List Partitioning can be used so that partitions get added automatically when a new process is defined and executed.
3. Before executing the BSP process, existing data for that process can be removed from FSI_O_PROCESS_CASH_FLOWS by using the DELETE of the TRUNCATE PARTITION function. This will ensure that the engine does not spend time doing that activity.

Some other server and database level settings that can improve performance are:

1. REDO Log size of the database can be increased. This will reduce log switch waits and improve overall time for analytical operations.
2. CURSOR_SHARING parameter of the database can be set to FORCE. By doing this database will try to convert SQL queries generated by the Cash Flow Engine to use bind variables which will reduce hard parses and can improve performance.

The above are just for guidance and you must take the help of database administrators and other system personnel to implement the above taking your specific infrastructure and other requirements into consideration.

36 Appendix B: Multi-Language Support

With the introduction of Multi-Locale Support, the user interfaces can be viewed in various languages. The display language is a selection on the login screen.

In addition to the base language (American English, for example, en_US), the following languages are currently supported for BSP, by installing the associated Language Pack.

> **NOTE** BSP's planning interfaces are currently only available in American English.

Language Name	Java Locale
Arabic	AR_EG
Portuguese	PT_BR
French	FR_FR
German	DE_DE
Indonesian	IN_ID
Italian	IT_IT
Japanese	JA_JP
Korean	KO_KR
Russian	RU_RU
Simplified Chinese	ZH_CN
Spanish	ES_ES
Thai	TH_TH
Traditional Chinese	ZH_TW
Vietnamese	VI_VN
Turkish	TR_TR
Hebrew	iw_IL
French Canada	fr_CA

Depending on the type of the rule, the Name/Description specified during create/edit is either attached to the login locale or is stored independent of the login locale. The selection of the login locale, therefore, governs which assumptions/rules are visible, and which are not visible. The following illustrates the visibility of assumptions and rules, across languages in the 8.0.0.0.0 release. This applies to all Summary screens, embedded selections in subsequent screens, and so on.

Table 49: Visibility of Assumptions and Rules

Assumption / Rules	Visible across all languages	Visible only in the creation language*
Common Object Maintenance		
Process Tuning		✓
Simplified Batch	✓	✓
Holiday Calendar**	✓	
SQL Rules	See the OFSAAI User Guide to verify the behavior.	
Data Entry Forms and Queries		
Dimension Management		
(Attributes, Members, and Hierarchies)		
Filters		
Expressions		
Common Object Maintenance> Rate Management		
Interest Rate Codes **	✓	
Currencies **	✓	
Economic Indicators **	✓	
BSP Maintenance		
Behavior Patterns	✓	
Payment Patterns **	✓	
Repricing Patterns **	✓	
Product Profiles**	✓	
Time Buckets **	✓	
BSP Assumption Specification		
Product Characteristics		✓
Discount Methods		✓
Prepayments		✓
Prepayment Models		✓
Rate Dependency Patterns		✓
Forecast Rate Scenarios		✓

Forecast Balances		✓
Transaction Strategies		✓
Maturity Mix		✓
Pricing Margin		✓
Transfer Pricing Rules		✓
TP Adjustments		✓
Stochastic Rate Indexing		✓
BSP Processing		
Static Deterministic Process		✓
Static Stochastic Process		✓
Dynamic Deterministic Process		✓
Dynamic Stochastic Process		✓
Cash Flow Edits	✓	

* A future release (TBD) will expand visibility for many of these application object types, to provide visibility regardless of logged-in locale.

** These object types are visible across all languages because the Name and Descriptions are not stored in translation-compatible structures, which is different from the storage format for AAI objects like Dimension Management, Filters, and Expressions.

37 Appendix C: Common Utilities and Scripts

This chapter covers the following topics:

37.1.1 RMIPC.SH Script

The rmipc.sh script is a utility script that cleans up shared memory segments and semaphores for a given Unix User ID. This file will be present as part of every OFSAA application build and is available in the $FIC_HOME/ficdb/bin folder. Passing the User ID as a command line is optional. When it is not passed as a command line argument, the shell script will default the ID to that of the currently logged-in Unix user. The script will first check for any running OFSAA processes (for example BSP, FTP, PFT) before attempting to remove any shared memory segments or semaphores. If there are any running OFSAA processes, the script will not run.

NOTE

The script will always consider only the first 8 characters of the User ID while determining the list of open semaphores/shared-memory arrays.

If you are using AIX platforms, then this script will also kill your AM process since the AM process also creates semaphores in AIX. Any process under the OFSAA Unix ID provided which creates semaphores or shared memory segments may be killed. Also, be careful if OFSAA has been installed using the same Unix user as the installed Oracle database as this script will clean up all semaphores / shared memory arrays used by the Oracle database. The script is not meant to be used in a batch process.

38 Appendix D: Standard Navigation Paths

Typical Oracle Financial Services Balance Sheet Planning navigation paths are shown in this table. Access all of these pages through the BSP Administrator or BSP Analyst responsibility.

Table 50: Standard Navigation Paths

Page	Navigation Path
Application Preferences	Balance Sheet Planning > Application Preferences
Time Buckets Home	Balance Sheet Planning > BSP Maintenance > Time Buckets
Time Buckets – Income Simulation Buckets	Balance Sheet Planning > BSP Maintenance > Time Buckets > Income Simulation Buckets
Time Buckets – Repricing Gap Buckets	Not used by BSP
Time Buckets – Liquidity Gap Buckets	Not used by BSP
Product Profiles Home	Balance Sheet Planning > BSP Maintenance > Product Profiles
Behavior Pattern Home	Balance Sheet Planning > BSP Maintenance > Patterns > Behavior Patterns
Payment Pattern Home	Balance Sheet Planning > BSP Maintenance > Patterns > Payment Patterns
Repricing Pattern Home	Balance Sheet Planning > BSP Maintenance > Patterns > Repricing Patterns
Interest Rate Code Home	Common Object Maintenance > Rate Management > Interest Rates
Currency Rates Home	Common Object Maintenance > Rate Management > Currency Rates
Currencies Home	Common Object Maintenance > Rate Management > Currencies
Economic Indicators Home	Not used in BSP
Product Characteristics Home	Assumption Specification > Product Characteristics
Product Characteristics Details	BSP Assumption Specification > Product Characteristics > Add New
Prepayment Rule Home	BSP Assumption Specification > Prepayments

Page	Navigation Path
Prepayment Methodology	BSP Assumption Specification > Prepayments > Add New > Prepayment Method Selector > Add
Prepayment Models Home	BSP Assumption Specification > Prepayment Models
Prepayment Models Details	BSP Assumption Specification > Prepayment Models > New
Transfer Pricing Rules	BSP Assumption Specification > Forecast Assumptions > Transfer Pricing Rules
TP Adjustments	BSP Assumption Specification >Forecast Assumptions > TP Adjustments
Forecast Rates	BSP Assumption Specification > Forecast Rates
Forecast Rates Details	BSP Assumption Specification > Forecast Rates > New
Maturity Mix Home	BSP Assumption Specification > Forecast Assumptions > Maturity Mix
Maturity Mix Details	BSP Assumption Specification > Forecast Assumptions > Maturity Mix > Add New > Assumption Browser > Add
Pricing Margins Home	BSP Assumption Specification > Forecast Assumptions > Pricing Margins
Pricing Margins Details	BSP Assumption Specification > Forecast Assumptions > Pricing Margins > Add New > Assumption Browser > Add
Static Deterministic Process Home	BSP Processing > Static Deterministic Process
Cash Flow Edits Process	BSP Processing > Cash Flow Edits

39 Appendix E: Export of Dimensions and Forecast Set Cash Flow Results

This feature will enable the user to export the dimensions and forecast set cash flow results into the CSV or TSV file. Following are the dimensions that will be exported:

- Forecast set scenario
- Forecast set version
- Legal entity
- Leg type
- Result type
- Financial elements
- Currency
- Planning center
- Planning product

39.1 Database Tables used for Dimensions

The following table lists the database tables used for dimensions.

Table 51: Database Tables Used for Dimensions

Dimension	Table Names	Filter Criteria
Forecast Set	FSI_M_BSP_FCAST_SET FSI_M_OBJECT_DEFINITION_B FSI_M_OBJECT_DEFINITION_TL	Based on Forecast set id
Scenario	FSI_CONSOLIDATION_CD FSI_CONSOLIDATION_MLS	
Version	FSI_VERSION_CD FSI_VERSION_MLS	
Legal Entity	DIM_LEGAL_ENTITY_B DIM_LEGAL_ENTITY_TL	
Leg Type	FSI_LEG_TYPE_CD FSI_LEG_TYPE_MLS	
Result Type	FSI_RESULT_TYPE_CD FSI_RESULT_TYPE_MLS	

Dimension	Table Names	Filter Criteria
Financial Element	DIM_FINANCIAL_ELEMENTS_B DIM_FINANCIAL_ELEMENTS_TL	Financial element ids less than or equal to 650 will be exported
Currency	FSI_CURRENCY_MLS FSI_CURRENCIES	All the active currencies will be exported
Planning Center	DIM_ORG_UNIT_B DIM_ORG_UNIT_TL	Based on the application preferences planning center dimension table is selected
Planning Product	DIM_GENERAL_LEDGER_B DIM_GENERAL_LEDGER_TL Or DIM_COMMON_COA_B DIM_COMMON_COA_TL or DIM_PRODUCTS_B DIM_PRODUCTS_TL	Based on the application preferences product dimension table is selected
Forecast Set Master Results	FSI_O_BSP_MASTER_RES_DTL	Based on Forecast set id

39.2 Configuration File

The configuration file “bsp_forecastset_export.properties” available under <FIC_DB>/conf folder. This file will be used for configuring the following details:

Table 52: bsp_forecastset_export.properties Configuration File

Property Name	Details
ExportFormat	Export files format. The value should be either S or H. S for standard database format and H for Hyperion import format.
ExportFileType	Export files type. The value should be either CSV or TSV.
FilePath	All the exported files will be placed under this path.
MasterResDetailFileName	File name of forecast set cash flow results.
MLS_CD	Locale value. Example: US

Property Name	Details
ForecastSet	If the value is 'Y' then forecast set definitions will be exported
Scenario	If the value is 'Y' then scenarios will be exported
Version	If the value is 'Y' then versions will be exported
LegalEntity	If the value is 'Y' then legal entities will be exported
LegType	If the value is 'Y' then leg types will be exported
ResultType	If the value is 'Y' then result types will be exported
FinancialElement	If the value is 'Y' then financial elements will be exported
Currency	If the value is 'Y' then currencies will be exported
PlanningCenter	If the value is 'Y' then planning center hierarchies will be exported
PlanningProduct	If the value is 'Y' then planning product hierarchies will be exported
AppendPrefix	If the value is 'Y' then the prefix will be appended to the code or id fields. This property is used only if ExportFormat is H.
ForecastSetPrefix	Prefix value to be appended for forecast set.
ScenarioPrefix	Prefix value to be appended for the scenario.
VersionPrefix	Prefix value to be appended for version.
LegalEntityPrefix	Prefix value to be appended for the legal entity.
LegTypePrefix	Prefix value to be appended for leg type.
ResultTypePrefix	Prefix value to be appended for result type.
FinancialElementPrefix	Prefix value to be appended for financial element.
PlanningCenterPrefix	Prefix value to be appended for planning center.
PlanningProductPrefix	Prefix value to be appended for planning Product.

39.3 Export

The shell script file “bsp_forecastset_export.sh” is available under the <FIC_DB>/bin folder. This file can be executed for exporting the dimensions and forecast set cash flow results. This shell script file can be executed directly from a putty session or creating an ICC batch in the application.

1. Execution from Putty session:

   Navigate to <fic_db>/bin folder and execute the following statements

   ./bsp_forecastset_export.sh <infodom name> <forecast_set_id>

   Example: ./bsp_forecastset_export.sh OFSBSPINFO 200275

Figure 254: Export Dimensions using Putty Session

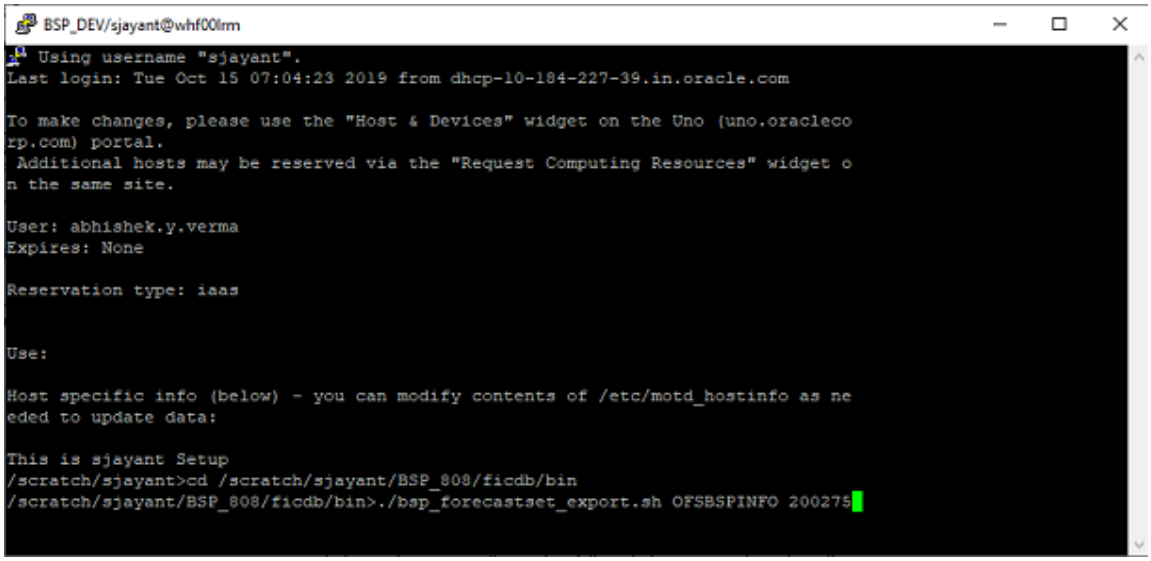
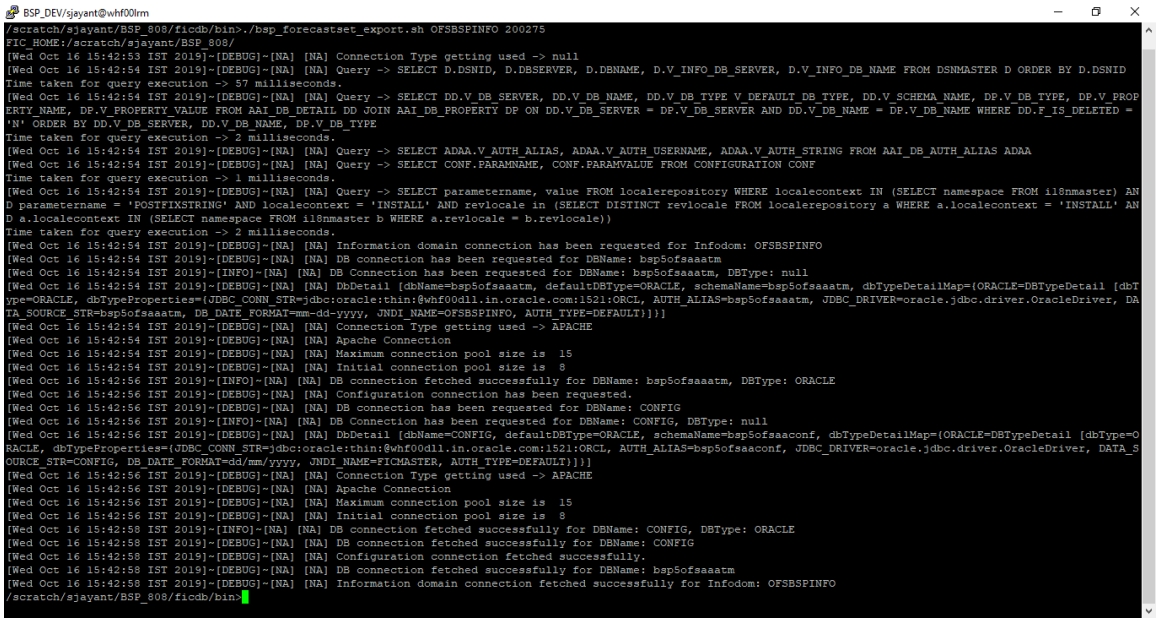


Figure 255: Export Dimensions using Putty Session



2. Execution using ICC batch:

   Batch Creation:

   a. Navigate to Common Object Maintenance > Operations > Batch Maintenance screen and click on the “Add” link for adding the new batch definition.

   b. Provide the all necessary details in the “Batch Maintenance” popup screen and click on the Save button.

   c. Select the new batch definition in the “Batch Name” grid.

   d. Click on the “Add” link in the “Tasks Details” grid for adding the task details. Provide the following details in the “Task Definition” popup screen and click on the Save button.

      Components: RUN EXECUTABLE

      Executable: bsp_forecastset_export.sh,<Infodom Name>,<Forecast set id>

      Example: bsp_forecastset_export.sh,OFSBSPINFO,200275

Batch Execution:

   e. Navigate to Common Object Maintenance > Operations > Batch Execution screen. Select the new batch definition in the “Batch Details” grid and also provide the date and click on the “Execute Batch” button for executing the batch.

> **NOTE** The selected date is not used anywhere so it can be any date.

This batch execution will export the dimensions and forecast set cash flow results.

> **NOTE** <ftpshare>/logs/bsp_export_log.log file can be referred for detailed log information’s.

40 Appendix F: OFS BSP Error Messages

Error Messages in this appendix apply generally to OFSAA Cash Flow Engine processes. Some errors in this appendix could never be generated by BSP.

Table 53: BSP Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
<Assumption rule type> in Oracle BSP Process Rule <Assumption rule name> not found in database	The Assumption Rule cannot be found in the database.	105	If the rule is critical for processing, the processing is stopped.
No Match for IRC	Interest Rate Code cannot be found in the active Historical Rates database.	110	When the instrument reprices, it will receive a zero rate.
No Data for IRC	Interest Rate Code exists in the active Historical Rates database, but there are no corresponding rate values.	115	When the instrument reprices, it will receive a zero rate.
Dimension Types mismatch: COL vs. Application Preference for dimension: <dimension number>	Definition for dimension chosen as product dimension in Application Preferences has changed or no longer exists in the database. Also can relate to the Organizational Unit dimension if two-dimension output processing is defined.	120	Processing is stopped.
No of Buckets mismatch Time Bucket in <Assumption Rule>	The assumption Rule was created when the active Time Bucket Rule held more/fewer buckets than it has currently; therefore, the Assumption Rule contains more/less bucket information than necessary.	325	If the Assumption Rule holds more buckets than what currently exists, only the buckets within the current modeling term will be used. If the Assumption Rule holds fewer buckets than what currently exists, the assumption for the last bucket will be carried forward for the remainder of the modeling term.
Distributed Option in Forecast Balance Assumptions not applicable for buckets with a term of 1 Day. Defaulted to Bucket End.	New Business timing is “Distributed” and bucket end date is the same as bucket start date.	326	New Business timing is defaulted to the Bucket end.
Inconsist. Run: MattStrat FcstBal PrMrgn must be def together	New business assumption rules (Pricing Margin, Maturity Strategy, Forecast Balance) are incomplete, some but not all have been defined.	330	Processing is stopped.
Inconsist. Run: Missing stochastic process assump.	Missing stochastic process assumptions.	330	Processing is stopped.

Inconsist. Run: Stochastic Rate Index Rule is not defined	The Stochastic Rate Rule is not defined in the Process Rule.	330	Processing is stopped.
Inconsist. Run: No Options Selected for Sel. Reproc.	No Options Selected for Selective Reprocessing in the Process Rule.	330	Processing is stopped.
Inconsist. Run: No Instrument Tables selected	There are no Instrument Tables selected in the Process Rule.	330	Processing is stopped.
Inconsist. Run: Inconsistent Sel. Reproc. buckets	The number of modeling buckets in results is not consistent with the number of modeling buckets in the active Time Bucket Rule during a selective reprocessing run.	330	Processing is stopped.
Inconsist. Run: Duplicate AutoBal leaves	Duplicate Auto Balance leaves defined in Application Preferences.	330	Processing is stopped.
Inconsist. Run: Not all AutoBal leaves defined	Not all Auto Balancing leaves are defined.	330	Processing is stopped.
Can't hit target for Leaf member:<leaf number> bucket: <bucket number>	It is impossible to calculate a new add balance that will satisfy the conditions required for new business balances.	335	No new business will be added to this bucket.
No Product Char. for leaf member: <leaf number>	Payment and repricing data have not been set up in the current Product Characteristics Rule for leaf members being processed.	340	Default characteristics will be used: • amortization type = 700 • payment frequency = original term • percent taxable = 100% • accrual basis = 30/360 • repricing frequency = 0
Invalid record: Invalid Amortization Code leaf member: <leaf number>	Amortization code is not equal to 100, 200, 400, 500, 600, 700, 710, 820, 830, 840, 850	345	Oracle BSP will assume an amortization code of 700
Invalid record: Maturity Date in the past leaf member: <leaf number>	The Maturity Date is less than the As of Date	345	The Record is not processed.
Invalid record: Remaining number of payments <= 0 leaf member: <leaf number>	The Remaining number of payments is less than or equal to zero.	345	The Record is not processed.
Invalid record: Pmt Freq = 0 leaf member: <leaf number>	Payment frequency is equal to zero on an amortizing instrument.	345	The Record is not processed.
Invalid record: AmrtTerm < OrgTerm on amortizing instrument leaf member: <leaf number>	The Amortization term is less than the original term for amortizing instruments.	345	Re-amortization of payment will be affected.

Invalid record: Next payment date in the past leaf member: <leaf number>	The next payment date is less than the as of date.	345	If the next payment date is much less than the as of date, it may cause the system to run out of memory.
Invalid record: Invalid net margin code leaf member: <leaf number>	Net margin code <> 0 or 1	345	Oracle BSP will default the net margin code to 0: Floating Net Rate
Invalid record: Current payment = 0 on amortizing instrument leaf member: <leaf number>	Current payment equal to zero and amortization code is other than simple/non-amortizing.	345	For amortization codes of 100, 500, and 600, interest will be capitalized as principal. For the amortization code of 820, no principal payments will be made.
Invalid record: Valid rate cap < current rate leaf member: <leaf number>	Rate Cap is not equal to zero and it is less than the current rate.	345	Rate cap will be imposed on the first repricing date.
Invalid record: Valid rate floor > current rate leaf member: <leaf number>	The Rate Floor is not equal to zero and it is greater than the current rate.	345	Rate floor will be imposed on the first repricing date.
Invalid record: Next repricing date in the past on repricing instrument leaf member: <leaf number>	Repricing frequency is not equal to zero and the next repricing date is less than the as of date.	345	If the next repricing date is very far from the past, it may cause the system to run out of memory.
Invalid record: Invalid int rate code on repr instr leaf member: <leaf number>	Reprice frequency is greater than zero and Interest Rate Code is not found in the active Historical Rates database.	345	The instrument will not reprice.
Invalid record: Original term = 0 leaf member: <leaf number>	Original term is equal to zero.	345	This will produce erratic results if the instrument is Rule of 78's; amortization term is also zero, or payment frequency is also zero on a non-amortizing instrument.
Invalid record: Current net rate <= 0 on amortizing instrument leaf member: <leaf number>	Amortization code is 100, 500, 600, 820 and current net rate <= 0.	345	Negative income will be generated for positive balances.
Invalid record: Inconsistency of reprice freq and amortization leaf member: <leaf number>	Amortization code is 500 or 600 and reprice frequency is zero or amortization code is 100 and reprice frequency is non zero.	345	Reprice frequency will overwrite characteristics defined by the amortization type code.
Invalid record: No of Events>16000	The number of events is greater than 16,000.	345	
Invalid record: OrgTerm and PmtFreq = 0	Both original term and payment frequency are equal to zero.	345	Record is ignored.
Invalid record: Invalid Account Type	Invalid Account Type	345	Logs an error, continues execution.
Invalid record: Deferred calculations do not converge	Deferred calculations do not converge	345	Logs an error and recognizes all deferred income at maturity.

Invalid record: YTM Calculations do not converge. leaf: <leaf number>	YTM calculation do not converge	345	Logs an error and the YTM for the record is assumed to be zero.
Invalid record: EIR Calculations do not converge. leaf: <leaf number>	EIR calculation do not converge.	345	Logs an error and the EIR for the record is assumed to be zero.
Invalid record: Behavior Type definition is inconsistent between the Behavior Pattern and BEHAVIOR_TYPE_CD. Defaulted to the Behavior Type specified in the Behavior Pattern. leaf: <leaf number>	The Behavior type code in the instrument record is not consistent with the behavior type specified in the behavior pattern definition.	345	Logs an error and the Behavior Type specified in the Behavior Pattern is used.
Invalid record: BEHAVIOR_SUB_TYPE_CD is invalid. Unable to process. leaf: <leaf number>	NPA or D and R behavior pattern is used but the behavior subtype code in the instrument record is invalid.	345	Logs an error and the Record is not processed.
Invalid record: Behavior pattern definition does not exist. Unable to process. leaf: <leaf number>	Behavior pattern definition doesn't exist.	345	Logs an error and the Record is not processed.
Invalid record: Accrued Interest <> 0 and (Last_payment_date < As_of_date) for Behavior pattern record. Accrued interest may be overstated. leaf: <leaf number>	Instrument record is using non-maturity behavior pattern and last payment date is less than As of Date and Accrued interest is not 0.	345	Logs an error and the calculated accrued interest may be overstated.
Invalid record: Invalid Effective Interest Rate on instrument record; Market value, Yield to Maturity, Duration, Modified Duration, Convexity values have been calculated using 0 Effective Interest Rate. leaf: <leaf number>	Effective Interest Rate in the instrument record is less than 0 or greater than 99 and the discount method is EIR and in the calculation block Market value is selected and EIR is not selected.	345	Logs an error and the Market value, Yield to Maturity, Duration, Modified Duration, Convexity values will be calculated using 0 Effective Interest Rate.
Invalid record: Invalid Average Life. leaf: <leaf number>	The calculated Average life value for the record is 0.	345	Logs an error
Accrued Interest = 0 and (Last_payment_date < As_of_date) for Multiple Reprice Instrument record. Net interest on first payment event may be understated. Leaf <leaf number>	Last Payment Date/Last Reprice Date < As of Date and Accrued Interest is not supplied in the instrument	345	Logs an error, continues execution.
Interest in Advance is not supported for multiple reprice instruments. Hence defaulted	Multiple Reprice events with interest paid in advance.	345	Logs an error, continues execution.

to Interest in Arrears. Leaf <leaf number>			
For Multiple Reprice Instruments with repricing patterns, the compounding is defaulted to None. Leaf <leaf number>	If it is a multiple reprice instrument with repricing patterns	345	Logs an error, continues execution.
For Floating rate Multiple Reprice instruments, the compounding is defaulted to None. Leaf <leaf number>	For floating rate instruments with multiple reprice.	345	Logs an error, continues execution.
For Multiple reprice instruments where compounding frequency <> reprcing frequency. The compounding is defaulted to None. Leaf <leaf number>	Compounding frequency <> Repricing frequency	345	Logs an error, continues execution.
Accrued Interest Gross = 0 and (Last_payment_date < As_of_date) for Multiple Reprice Instrument record. Gross interest on first payment event may be understated. Leaf <leaf number>	Last Payment Date/Last Reprice Date < As of Date and Accrued Interest Gross is not supplied in the instrument	345	Logs an error, continues execution.
Accrued Interest TRate = 0 and (Last_payment_date < As_of_date) for Multiple Reprice Instrument record. T rate interest on first payment event may be understated. Leaf <leaf number>	Last Payment Date/Last Reprice Date < As of Date and Accrued Interest Rate is not supplied in the instrument	345	Logs an error, continues execution.
Index Adjustment Type is Not Applicable and Capital Protection Category is filled in. Instrument processed without Inflation adjustment.	When Index Adjustment Type is Not Applicable and Capital Protection Category is filled in. Instrument processed without Inflation adjustment.	345	Logs an error, continues execution.
Index Adjustment Type is <> Not Applicable, and Base Index Value is not provided. Instrument processed without Inflation adjustment.	When Index Adjustment Type is <> Not Applicable, and Base Index Value is null. Instrument processed without Inflation adjustment.	345	Logs an error, continues execution.
No data available in Account Index History table. Hence Instrument processed without Inflation adjustment.	When Index Name filed is null and no data available in Account Index History table. The instrument is processed without Inflation adjustment.	345	Logs an error, continues execution.
Index Adjustment Type is <> Not Applicable, and Amortization code is other	When Index Adjustment Type is <> Not Applicable, and Amortization code <> 100,	345	Logs an error, continues execution.

than 100, 500, 700, 800, 801, 802, 820. Instrument processed without Inflation adjustment.	500, 700, 800, 801, 802, 820. Instrument processed without Inflation adjustment.		
Index value has data type other than 'Numeric' in Rate Management Economic Indicator. Instrument processed without Inflation adjustment.	When a record has Index Name filed in and Index value has data type other than 'Numeric' in Rate Management Economic Indicator. Instrument processed without Inflation adjustment.	345	Logs an error, continues execution.
Capital Protection Category is Max during life, and Maximum Index value not provided. Maximum Index value to be calculated from AS_OF_DATE.	Capital Protection Category is Max during life, and Maximum Index value is not provided. Maximum Index value to be calculated from AS_OF_DATE.	345	Logs an error, continues execution.
Payment date does not have Index value in Account Index History table. Index Factor of 1 will be considered on those payment dates.	When the Index Name field is null and Payment date does not have Index value in Account Index History table. Index Factor of 1 will be considered on those payment dates.	345	Logs an error, continues execution.
Bucket Number Mismatch	The Assumption Rule was created when the active Time Bucket Rule held more/fewer buckets than it has currently; therefore, the Assumption Rule contains more/less bucket information than necessary.	350	If the Assumption Rule holds more buckets than what currently exists, only the buckets within the current modeling term will be used. If the Assumption Rule holds fewer buckets than what currently exists, the assumption for the last bucket will be carried forward for the remainder of the modeling term.
No Target for Roll/Auto leaf member: <leaf number> bucket: <bucket number>	Forecast Balance methods of Target Average or Target End cannot be used for a Leaf member value used as a roll-into leaf or as an auto-balancing leaf member.	360	Targeting methods cannot be used for leaves specified as roll-into or auto-balancing. The targeted balances will be ignored.
Res_det: Security violation	The current user does not have the right to create an Oracle BSP results table.	365	Processing is stopped.
Res_det: Truncate fail	The results table for the current processing rule could not be cleared of old data.	365	Processing is stopped.
Res_det: Creation fail	Results table for new processing Rule could not be created.	365	Processing is stopped.

Res_det the structure of the result_detail table was invalid for selective reprocessing	The structure of the current Result Detail table does not match the IDT Result Detail Table Template.	365	Processing is stopped.
Account Type not defined for leaf member (leaf number)	In Dimension Member Set-Up, an account type attribute has not been specified for the current leaf member.	370	Account type will default to Earning Assets.
No. of scen in results > expected leaf member: <leaf number>	The number of scenarios in the results set is greater than the number of scenarios expected from querying the current Forecast Rates Assumption Rule while processing Auto-balancing.	380	Auto-balancing will only be processed for the scenarios included in the current Forecast Rates Assumption Rule.
Invalid interest type - defaulted to interest in arrears	The interest type code is not equal to 0 or 1.	385	The instrument is defaulted to “interest in arrears”.
Invalid Pmt pattern: pmt pattern code. <Payment Pattern Code>for new business - abs val	Payment Pattern assigned to new business has a constant payment amount.	390	Error is logged.
No Amrt Type in Product characteristics for leaf member:<leaf number>	No amortization type code has been assigned in Product Characteristics for the current leaf member.	395	An error message is logged and the instrument is defaulted to simple interest.
No Amrt Type in Trans. Str. for leaf member:<leaf number>	No amortization type code has been assigned in Transaction Strategy for the current leaf member.	396	An error message is logged and the instrument is defaulted to the simple interest
Formula Results Error: Mismatch in buckets number	The number of modeling buckets in the result set does not match the number of modeling buckets defined in Formula Results.	397	Error is logged.
Invalid Currency Gain/Loss Basis. Defaulted to "Temporal"	fi	406	fi
Pay-Equivalent Compounding Convention. Defaulted to "Do Not Adjust"	fi	407	
Negative FullIndexGrs Rate for leaf member: <leaf number>	A negative fully indexed gross rate was calculated on a repricing event.	505	The negative rate will be assigned to the instrument.
Negative FullIndexNet Rate for leaf member: <leaf number>	A negative fully indexed net rate was calculated on a repricing event.	505	The negative rate will be assigned to the instrument.

Negative CurGrsRate Rate for leaf member: <leaf number>	A negative current gross rate was calculated on a repricing event.	505	The negative rate will be assigned to the instrument.
Negative CurNetRate Rate for leaf member: <leaf number>	A negative current net rate was calculated on a repricing event.	505	The negative rate will be assigned to the instrument.
Negative CurTrRate Rate for leaf member: <leaf number>	A negative current transfer rate was calculated on a repricing event.	505	The negative rate will be assigned to the instrument.
Spread rate not found in Pricing Margins Rule	There is no pricing margin defined for the current leaf member.	515	Zero will be defaulted as the pricing margin.
Rate Not Found	Forecasted rates do not exist for the interest rate code on the current instrument.	520	When the instrument reprices, it will receive a zero rate.
1st point used	Reprice date occurs before forecasting period; forecasted rates do not exist.	525	This may occur if the data holds a reprice date that is less than the As of Date. The instrument will reprice to the rate as of the As of Date.
Last point used	Reprice date occurs beyond the forecasting period; forecasted rates do not exist.	530	This may occur when calculating market values beyond the modeling term or calculating the last reprice/payment event for accruals in the last bucket. The instrument will reprice to the rate as of the last forecasted date.
Code found only	Interest rate code exists in the Forecast Rates Assumption Rule, but no rates have been forecast.	535	When the instrument reprices, it will receive a zero rate.
Prepayment tier not selected, zero prepayment rate used.	Market Rate and Quote Basis have been defined in the Prepayment Rule, but no tiers or prepayment percents have been created.	540	No prepayments will occur on this Leaf member.
Last payment date is before origination date.	The last payment date from the instrument record is before the origination date on the instrument record.	545	Logs error and continues. For Transaction Strategy, the last reprice date is set to the origination date.
No reprice frequency for adjustable record.	The instrument is coded as adjustable, but the repricing frequency is equal to zero.	550	The instrument will be treated as a fixed rate.
No schedule found for record.	No match can be found in the payment schedule table for the current record.	555	Logs error and defaults to simple interest record if payment frequency does not = 0.
Pattern data can not be found for AMRT_TYPE:<payment pattern code>	No payment pattern information has been defined	560	Log error and default to simple interest.

	for the documented amortization type code.		
No pattern information found for record.	Documented amortization type code exists in the database, but no supporting details are available.	565	Currently is used to notify users about invalid adjustable type code. Record defaults to fixed.
Maturity date from record does not match schedule data.	The maturity date on the instrument record does not exist in the payment schedule table for the current record.	570	Logs error. Uses maturity date for schedule.
Conv amrt with interest in advance defaulted to arrears.	The conventionally amortizing instrument is classified as interest in advance. This combination is not supported.	575	The instrument will be defaulted to interest in arrears.
Invalid Amrt. Type detected. Defaulted to Simple Int.	An unknown Amortization Type Code was used.	585	The instrument will be defaulted to simple interest.
No Repricing Pattern found for record.	An unknown Adjustable Type Code was used.	600	The instrument will be defaulted to Other Adjustable.
Invalid Event_Det_Seq (Adj_Type_CD:<Adjustable type code>); Evnt_dtl_seq should start from 0.	For an Event Sequence, the Event Detail Sequence has started from a non-zero value.	635	The repricing pattern is ignored and will produce erratic results if this repricing pattern is used.
1st point used.	Reprice date occurs before forecasting period; forecasted rates do not exist.	725	This may occur if the data holds a reprice date that is less than the As of Date. The instrument will reprice to the rate as of the As of Date.
Last point used.	Reprice date occurs beyond the forecasting period; forecasted rates do not exist.	730	This may occur when calculating market values beyond the modeling term or calculating the last reprice/payment event for accruals in the last bucket. The instrument will reprice to the rate as of the last forecasted date.
Negative Transfer Rate.		740	
Invalid duration generated for this row.	810	795	
Divide by zero			
Invalid record: Engine calculated Market Value (MARKET_VALUE_C) is more than its allowed size (9999.999999) hence resetting it as Market Value Clean (MARKET_VALUE_CLEAN_C). Leaf member:<<PLACEHOLDER>>.	If the value of column MARKET_VALUE_C is beyond specified precision, then MARKET_ VALUE_CLEAN_C value is considered for calculation (less than 9999.999999). If the value of MARKET_ VALUE_CLEAN_C is also beyond specified precision, then Engine will default this value to 100.	345	

Invalid record: Engine calculated Market Value Clean (MARKET_VALUE_CLEAN_C) is more than its allowed size (9999.999999) hence resetting it as Market Value (MARKET_VALUE_C). Leaf member:<<PLACEHOLDER>>.	If the value of column MARKET_VALUE_ CLEAN_C is beyond specified precision, then the MARKET_ VALUE_C value is considered for calculation (less than 9999.999999). If the value of MARKET_ VALUE_C is also beyond specified precision, then Engine will default this value to 100.	345	
Invalid record: Both Engine calculated Market Value Clean (MARKET_VALUE_CLEAN_C) & Market Value (MARKET_VALUE_C) are more than its allowed size (9999.999999) hence updating value as 100. Leaf member:<<PLACEHOLDER>>.	If the value of columns MARKET_VALUE_C and MARKET_ VALUE_CLEAN_C are beyond specified precision, Engine will default these values to 100.	345	

41 Appendix G: Integrate OFS BSP 8.1.0.0.0 and Hyperion EPBCS

Integrating PFS BSP with Hyperion Enterprise Planning and Budgeting Cloud Service (EPBCS) involves the following procedures:

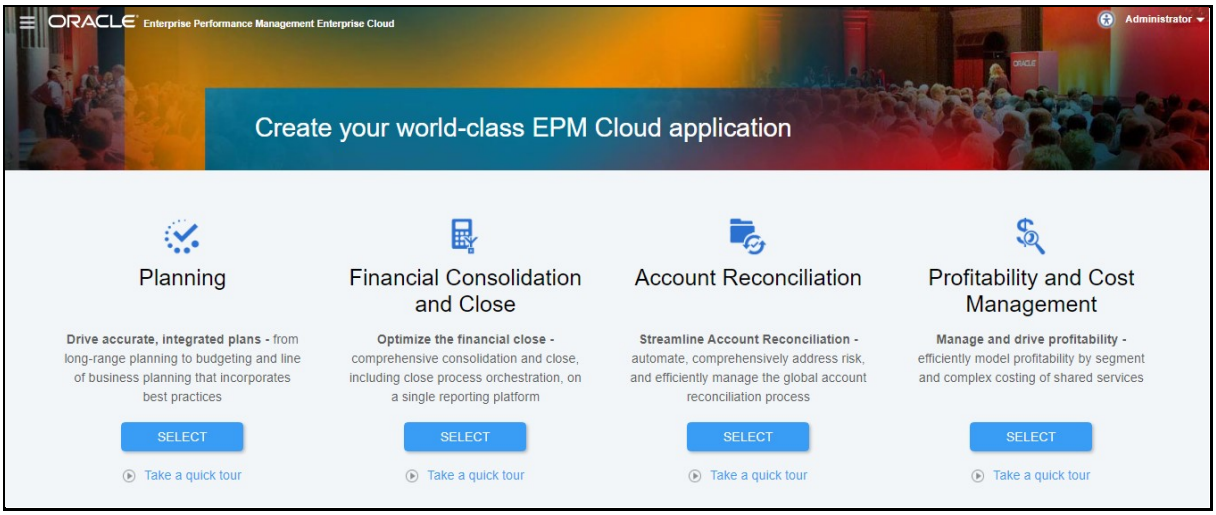
- Creating an Application
- Creating Dimensions
- Exporting the Dimensions and Forecast Set Cash Flow Results
- Importing Dimensions
- Refresh the Database
- Importing the Data

41.1 Creating an Application

To create an application, follow these steps:

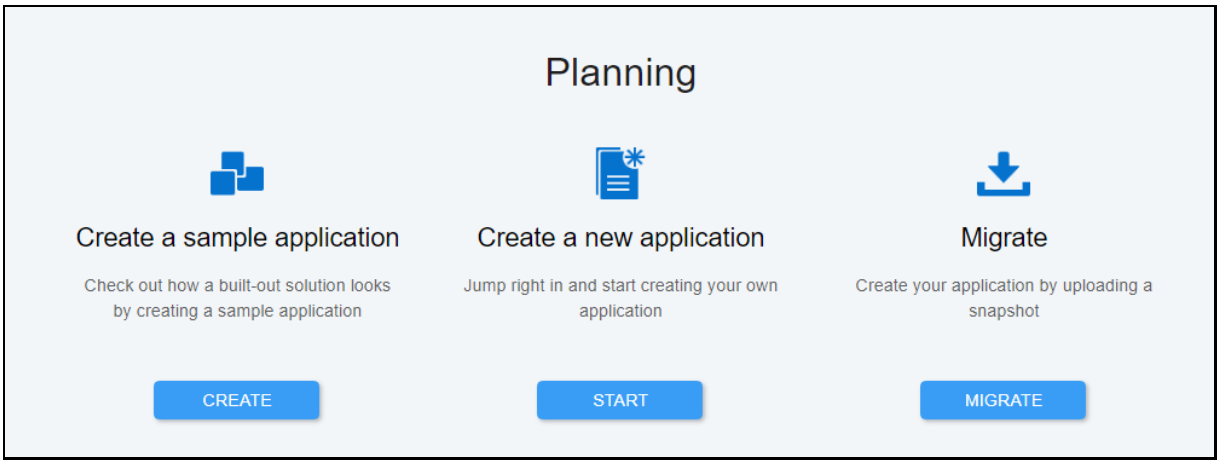
1. Click **Select** under Planning.

Figure 256: Enterprise Planning and Budgeting Cloud Service Landing Page



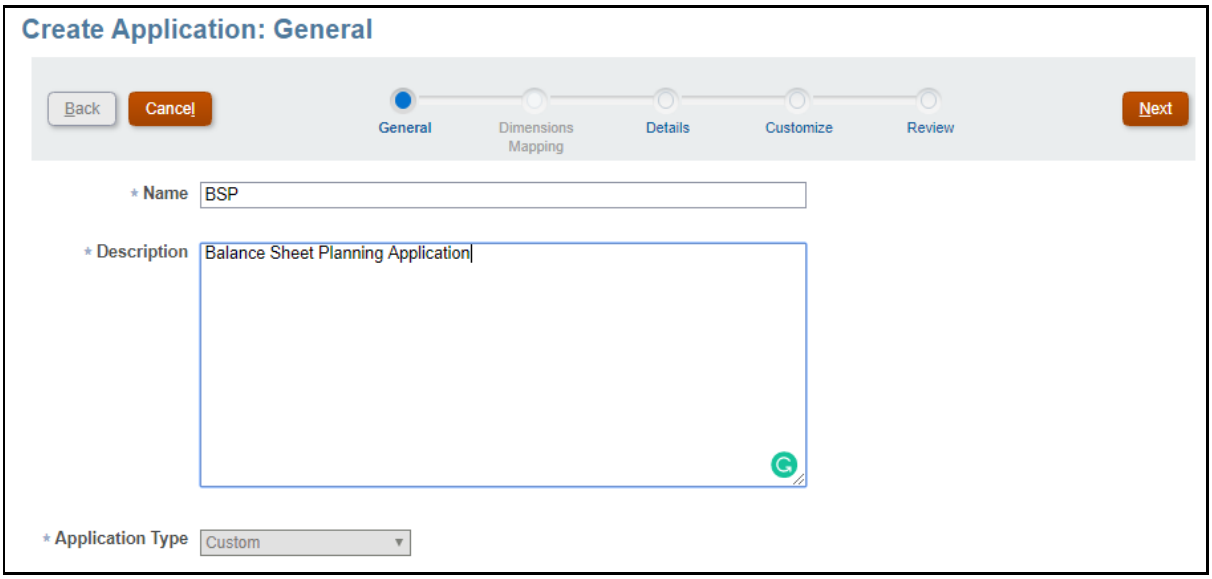
2. Click **Start** to create a new Planning Application.

Figure 257: Create Application



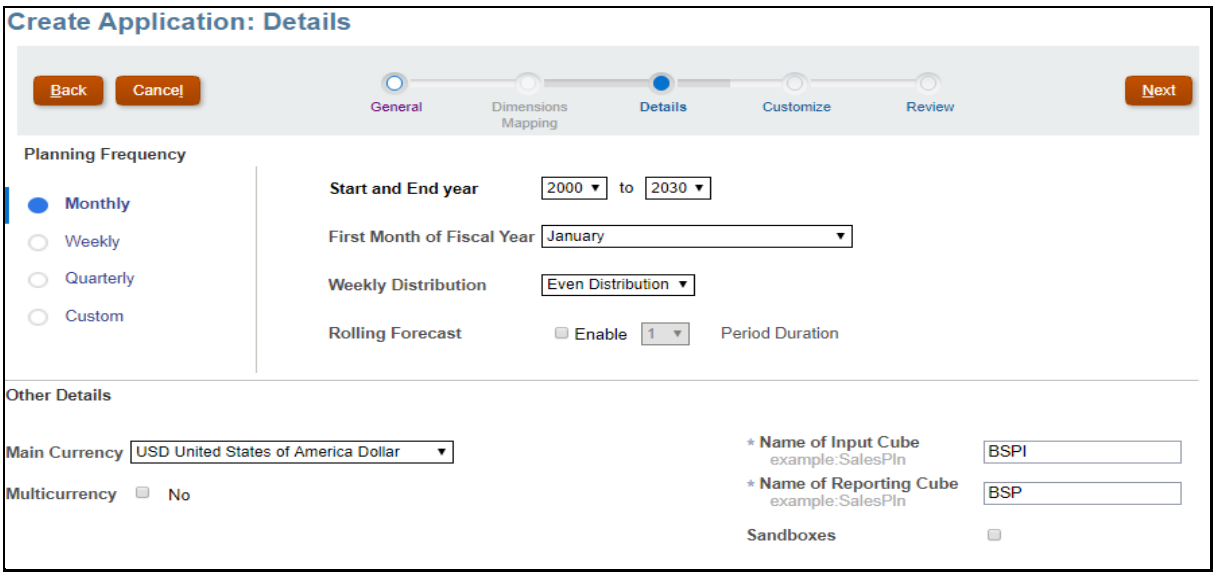
3. Enter an application name, description, select Application Type as Custom, and then click **Next**.

Figure 258: Create Application – General Details



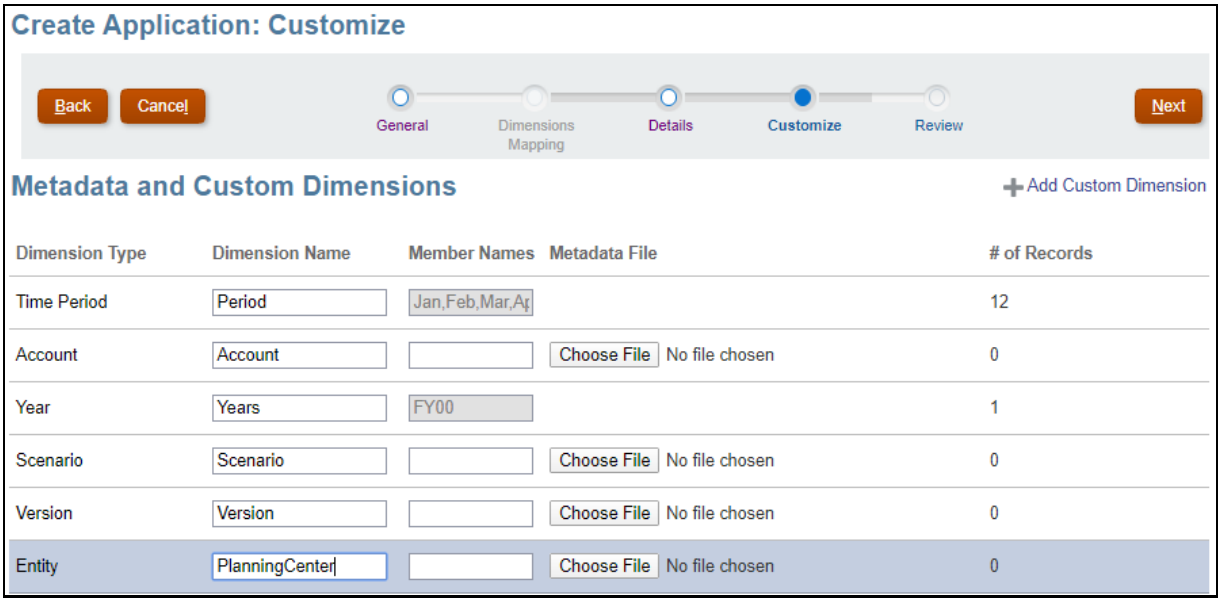
4. Select the value of the following options in Create Application: Details Wizard as specified below and click **Next**:
   a. **Planning Frequency**: Monthly.
   b. **Start and End Year**: Make sure to include the year that contains the historic actuals required for planning and analysis.
   c. **First Month of Fiscal Year**: January.
   d. **Weekly Distribution**: Even Distribution.
   e. **Main Currency**: Reporting Currency in OFSAA.
   f. **Multicurrency**: uncheck.
   g. **Name of the input cube**: user-defined.
   h. **Name of the reporting cube**: user-defined.

Figure 259: Create Application Details



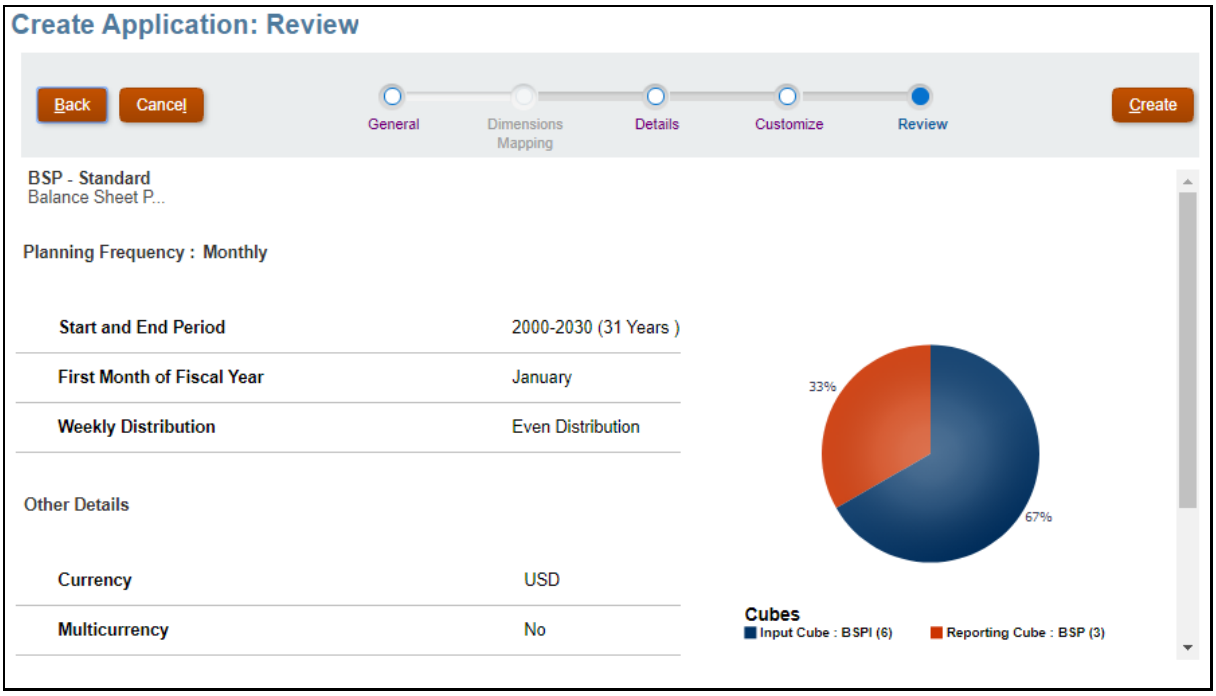
5. In the Metadata and Custom Dimensions tab change the Dimension Name of Entity to **Planning Center** and click **Next**.

Figure 260: Create Application - Customize



6. Review all the details and click **Create**.

Figure 261: Create Application - Review



41.2 Creating Dimensions

To create the dimensions, follow these steps:

1. Click Application, click Overview, and then click Dimensions.
2. Select Input Cube from the Cube Dropdown.
3. Click Create.
4. Create the following additional dimension in the Input Cube:
   a. Currency
   b. LegalEntity
   c. LegType
   d. PlanningProduct
   e. ResultType
   f. ForecastSet

NOTE All the dimensions must be created with the following mentioned specifications:

- Alias Table: Default
- Data Storage: Never Share
- Input Cube Selection Enabled

Figure 262: Create Dimensions

41.3 Exporting the Dimensions and Forecast Set Cash Flow Results

Run the Export utility From OFS BSP. For information on running the Export Utility, see Appendix E: Export of Dimensions and Forecast Set Cash Flow Results section.

As part of this step, an import file for all the dimensions (CSV or TSV) and forecast set cash flow results(.txt) will be created. Move all the files from the server to the local system.

41.4 Importing Dimensions

To import the dimensions, follow these steps:

1. Click **Application**, and then click **Overview**.
2. Click **Dimensions**, and then click **Import**.
3. On the Import Metadata page, click **Create**.
4. Select the location of the import file or files as Local:

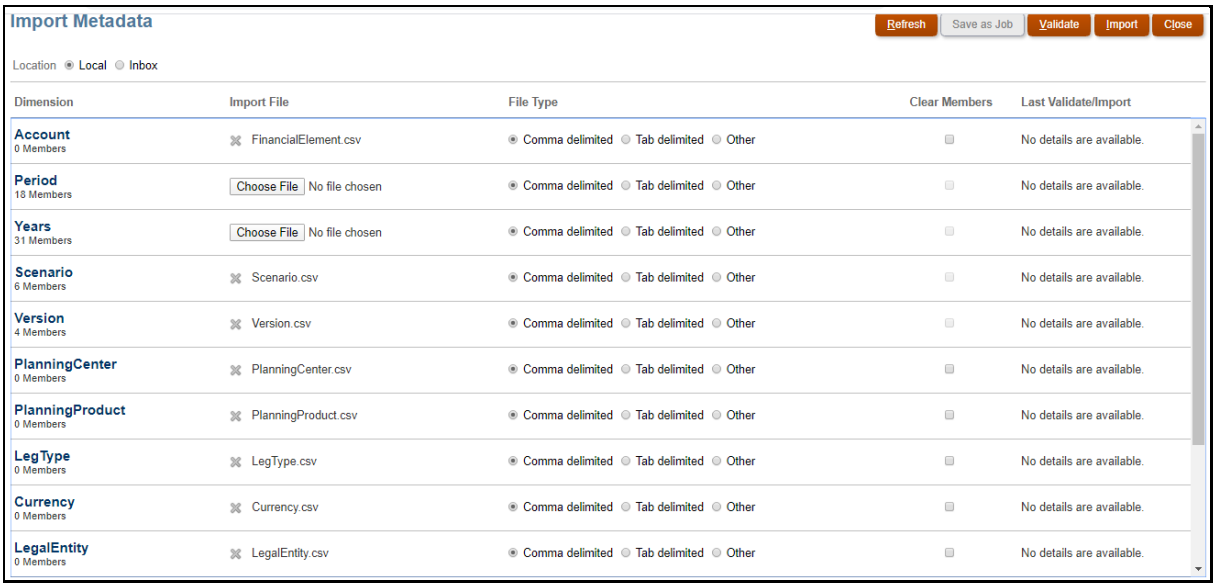
   Local: Loads the import file or files from a location on your computer. For Import File, click **Choose File** to select the import file on your computer for the artifact you're importing. Following are the files that must be used to load respective dimensions (file format can be CSV or TSV):

   - **Currency**: Currency.csv
   - **ForecastSet**: ForecastSet.csv
   - **LegalEntity**: LegalEntity.csv
   - **LegType**: LegType.csv
   - **PlanningProduct**: PlanningProduct.csv
   - **PlanningCenter**: PlanningCenter.csv
   - **ResultType**: ResultType.csv
   - **Scenario**: Scenario.csv
   - **Version**: Version.csv

- **Account**: FinancialElement.csv

5. For **File Type**, select **Comma delimited** or **Tab delimited** as per the format selected while exporting at **Step C**.
6. Click **Import** to run the import Operation.

Figure 263: Import Metadata



7. Go to **Application**, and select **Jobs** and check the status of all the dimensions are successfully imported or not.

41.5 Refresh the Database

To refresh the database, follow these steps:

1. Click Application, and then click Overview.
2. Click Actions, and then Refresh Database.
3. On the Refresh Database page, click Create.
4. To refresh the database now, click Refresh Database.

41.6 Importing Data

To import the data, follow these steps:

1. Click **Application**, and then click **Overview**.
2. Click **Actions**, and then click **Import Data**.
3. Click **Create**.
4. Select the location of the data import file as **Local**.
5. Select the Source Type of the data import file as **Essbase**.
6. Select Cube as **Input Cube**.

7. Click **Choose File** and navigate to the import file `MasterResultDetails.txt` and select it.
8. Click **Import**.
9. Go to **Application** and select **Jobs** and check the status of data is imported successfully or not.

41.7 Recurring Steps at different stages:

The following table lists the recurring steps in the procedure for integrating OFS BSP 8.1.0.0.0 and Hyperion EPBCS:

Table 54: Recurring Steps for Integrating OFS BSP 8.1.0.0.0 and Hyperion EPBCS

Stage	Steps need to be performed
ForecastSet Finalization	• Exporting the Dimensions and Forecast Set Cash Flow Results • Importing Dimensions • Refresh the Database
Introduction of a new hierarchy member	• Exporting the Dimensions and Forecast Set Cash Flow Results • Importing Dimensions • Refresh the Database
After every ForeCastSet export	• Importing Data

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