

Oracle Financial Services

Asset Liability Management User Guide



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Contents

1 About This Content

2 What is New in This Release for ALM Application

3 Introduction to Oracle Asset Liability Management

3.1	Overview of Oracle Financial Services Asset Liability Management	3-1
3.1.1	Oracle Asset Liability Management Key Benefits	3-1
3.1.2	Oracle Asset Liability Management and Other Oracle Financial Services Applications	3-2
3.1.3	Oracle Financial Services Enterprise Performance Management	3-2
3.1.3.1	OFSAA Data Model	3-2
3.1.3.2	OFSAA Infrastructure	3-2
3.1.3.3	OFS Funds Transfer Pricing	3-2
3.1.3.4	OFS Profitability Management	3-3
3.1.3.5	OFS Pricing Management, Transfer Pricing Component	3-3
3.1.3.6	OFS ALM	3-3
3.1.3.7	OFS BSP	3-4
3.1.3.8	OFSAA Business Intelligence Applications	3-4
3.1.3.9	Oracle Asset Liability Management Integrations	3-4
3.1.3.10	Oracle Financial Services Analytical Overview	3-4

4 Overview of OFSAA Infrastructure

4.1	Overview of Dimensionality in OFSAA	4-1
4.2	Referential Integrity	4-2
4.3	Dimension Attributes	4-2
4.4	Hierarchies	4-3
4.5	Rollup Members for Dimensions Supporting Hierarchies	4-3
4.6	Dimension Types	4-4
4.6.1	Key Processing Dimensions	4-4
4.6.2	Standard Dimensions	4-5

4.6.3	Simple Dimensions	4-5
4.6.3.1	Reserved Simple Dimensions	4-6
4.6.3.2	Simple Dimensions Used for Processing or Reporting Purposes	4-6
4.6.3.3	Simple Dimensions Used as Attribute Domains	4-6
4.7	Attributes	4-6
4.7.1	Unbounded and Bounded Attribute Data Types	4-7
4.8	Overview of OFSAA Rules	4-7
4.8.1	Dependencies	4-8
4.9	OFSAA Filters	4-8
4.10	OFSAA Expressions	4-9
4.11	Folders	4-9
4.12	Visibility of Rules	4-9
4.13	Access Type	4-10
4.14	Application Preferences	4-10
4.15	Global Preferences	4-11
4.16	System Configuration	4-11

5 OFSAA Rate Management

5.1	Interest Rates	5-1
5.1.1	Searching for Interest Rate Curve	5-2
5.2	Interest Rates Details	5-4
5.2.1	Creating an Interest Rate Code	5-4
5.2.2	Interest Rate Code Tabs	5-5
5.2.2.1	Navigating Between Interest Rate Code Tabs	5-5
5.2.2.2	Parameters Tab	5-12
5.2.2.3	Hybrid Term Structure Tab	5-15
5.2.3	Batch Creation	5-18
5.2.3.1	Running Hybrid Rate Generation using Simplified Batch	5-19
5.2.3.2	Viewing Log Messages	5-20
5.3	Currency	5-20
5.3.1	Searching for Currency	5-20
5.3.2	Editing Currencies	5-22
5.3.3	Adding Currencies	5-22
5.3.4	Deleting Currencies	5-22
5.4	Currency Rates	5-22
5.4.1	Preparing to Work with Exchange Rate Data	5-23
5.4.2	Adding Exchange Rate Data	5-23
5.4.3	Adding Multiple Exchange Rates	5-24
5.4.4	Editing Exchange Rate Data	5-25
5.4.5	Viewing Exchange Rate Data	5-25

5.4.6	Deleting Exchange Rate Data	5-25
5.4.7	Data Loader	5-25
5.4.8	Excel Compatibility	5-25
5.5	Currency Exchange Rate Validation	5-26
5.5.1	Features of Exchange Rate Validation	5-26
5.5.2	Currency Rate Validation	5-26
5.5.3	Validating Exchange Rate Relationships	5-27
5.5.4	Running an Exchange Rate Validation	5-28
5.5.4.1	Running a Validation Immediately	5-28
5.5.5	Scheduling One or More Validations	5-31
5.5.6	Viewing the Messages	5-31
5.6	Economic Indicators Summary Page	5-31
5.6.1	Searching for Economic Indicator	5-32
5.6.2	Economic Indicators Details	5-33
5.6.3	Adding an Economic Indicator	5-33

6 Simplified Batches

6.1	Standard OFSAA Infrastructure Batching Functionality	6-1
6.1.1	Batch Maintenance	6-1
6.1.1.1	Batch Execution	6-2
6.1.1.2	Other Operations Batch Functionality	6-2
6.1.2	Simplified Batches	6-2
6.1.2.1	Searching for a Simplified Batch	6-3
6.2	Simplified Batch Details	6-4
6.3	Creating a Simplified Batch	6-5
6.3.1	Batch Execution Type	6-6
6.3.2	Searching Task Name	6-6
6.3.3	Task Details	6-6
6.3.4	Task Selection	6-8
6.4	Running a Simplified Batch	6-10
6.5	Viewing the Task Logs	6-10
6.6	Additional Batch Options	6-11

7 Holiday Calendar

7.1	Searching for a Holiday Calendar	7-1
7.2	Creating a Holiday Calendar	7-2
7.3	Executing Holiday Calendar	7-4
7.4	Holiday Exceptions	7-4

8 Oracle Asset Liability Management Process

8.1	Overview of the Process	8-1
8.2	Key Operational Concepts	8-2
8.2.1	Modeling Using Account-Level Data	8-2
8.2.2	Separation of Different Types of Assumptions	8-2
8.2.3	Flexible Reporting Buckets	8-2
8.2.4	Structured Approach to Defining Rate Scenarios	8-3
8.2.5	Flexible Chart of Accounts	8-3
8.2.6	The Power of Assumption Rules	8-3
8.3	Reconciling the Data	8-5
8.4	Cleansing the Data by performing Cash Flow Edits	8-6
8.5	Setting Application Preferences	8-6
8.6	Activating Currencies and Loading Exchange Rates	8-6
8.6.1	Currency Definitions and Classifications	8-7
8.6.2	The Functional Currency	8-7
8.6.3	Reporting Currencies	8-7
8.6.4	Other Active Currencies	8-7
8.7	(Mandatory) Deciding on Historical Rate Information and Managing by Creating Interest Rate Codes	8-7
8.8	Defining Economic Indicators	8-8
8.9	Capturing Instrument Behavior for Non-standard Instruments	8-8
8.9.1	Defining Behavior Patterns	8-8
8.9.1.1	CFE Requirements and Functionality	8-9
8.9.1.2	Behavior Pattern Structure	8-10
8.9.1.3	Payment Events	8-11
8.9.1.4	Principal Runoff Term	8-12
8.9.1.5	Amount	8-12
8.9.1.6	Payment Type	8-12
8.9.2	Defining Payment Patterns	8-13
8.9.2.1	Payment Pattern Structure	8-13
8.9.2.2	Payment Events	8-13
8.9.2.3	Absolute Payment Patterns	8-15
8.9.2.4	Relative Payment Patterns	8-15
8.9.2.5	Split Payment Patterns	8-15
8.9.3	Defining Repricing Patterns	8-15
8.9.3.1	User-defined Repricing Pattern	8-16
8.9.3.2	User-defined Repricing Event	8-16
8.9.3.3	Relative Repricing Pattern	8-17
8.9.3.4	Absolute Repricing Pattern	8-17
8.9.3.5	Pricing with Balance Tiers	8-17
8.9.4	Loading Payment Schedule Details	8-18

8.10	(Mandatory) Defining Time Buckets	8-18
8.11	(Mandatory) Defining Product Characteristics	8-19
8.12	(Mandatory - Deterministic) Defining Forecast Rate Scenarios	8-19
8.13	Defining Prepayments	8-20
8.13.1	Prepayment Methodologies and Rules	8-20
8.13.2	Constant Prepayment Method	8-20
8.14	Prepayment Model Method	8-21
8.14.1	PSAMethod	8-22
8.14.2	Arctangent Calculation Method	8-23
8.15	Defining Discounting Methods	8-26
8.16	Defining Forecast Assumptions	8-26
8.17	Defining Transfer Pricing Rules	8-27
8.18	Transfer Pricing Methodologies and Rules	8-27
8.18.1	Redemption Curve	8-28
8.18.2	Spread from Interest Rate Code	8-28
8.18.3	Spread from Note Rate	8-29
8.18.4	Cash Flow: Average Life	8-29
8.18.5	Cash Flow: Duration	8-30
8.18.6	Straight Term	8-31
8.18.7	Cash Flow: Weighted Term	8-31
8.18.8	Cash Flow: Zero Discount Factors	8-32
8.18.9	Moving Averages	8-33
8.19	Defining Transfer Pricing Methodologies Using Node Level Assumptions	8-34
8.20	Defining Adjustment Rules	8-35
8.20.1	Adjustment Methods and Rules	8-35
8.20.1.1	Adjustment - Fixed-rate	8-36
8.20.1.2	Adjustment - Formula Based Rate	8-36
8.20.1.3	Adjustment – Use TP Method from Selected TP Rule	8-37
8.20.1.4	Adjustment - Fixed Amount	8-37
8.21	Defining Transaction Strategies	8-38
8.22	Defining Formula Results	8-38
8.23	(Mandatory – Stochastic) Defining Stochastic Rate Indexing Rules	8-39
8.24	(Mandatory) Defining and Running the Asset Liability Management Process	8-39
8.25	Reviewing Processing Errors	8-40
8.26	Accessing Asset Liability Management, Detail Cash Flow Results for Audit Purposes	8-40
8.27	Accessing Asset Liability Management, Interest Rate Audit Results	8-40
8.28	Analyzing Results	8-40
8.29	Reprocessing Erroneous Accounts	8-43
8.30	Consolidation of Results	8-43

9 Common Rule Management Tasks

9.1	Rule Summary Page	9-1
9.2	Searching for Rules	9-2
9.3	Creating Rules	9-3
9.4	Viewing and Editing Rules	9-3
9.5	Copying Rules	9-4
9.6	Deleting Rules	9-4
9.7	Dependency Checking	9-5

10 Application Preferences

10.1	Updating Application Preferences	10-1
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11 Cash Flow Edits

11.1	Creating Cash Flow Edit Process	11-3
11.2	Executing Cash Flow Edit Process	11-5
11.2.1	Using Cash Flow Edit UI	11-5
11.2.2	Batch Based Procedure	11-6
11.3	View Cash Flow Edit Process Log	11-7

12 User Defined Behavior Patterns

12.1	Creating Behavior Patterns	12-1
12.1.1	Defining Devolvement and Recovery Behavior Patterns	12-2
12.1.2	Defining Non-Maturity Behavior Patterns	12-3
12.1.3	Defining Non-Maturity Behavior Patterns (for Tractor TP Method use)	12-4
12.1.4	Defining Non-Performing Behavior Patterns	12-8
12.1.4.1	Export and Import Replicating Portfolio Data in Excel	12-9
12.1.4.2	Scheduling Replicating Portfolio Actions	12-10
12.2	Viewing and Editing Behavior Patterns	12-12
12.3	Copying Behavior Patterns	12-12
12.4	Deleting Behavior Patterns	12-13

13 User Defined Payment Patterns

13.1	Search for Payment Patterns	13-1
13.2	Create Payment Patterns	13-2
13.2.1	Define Absolute Payment Patterns	13-3
13.2.2	Define Relative Payment Patterns	13-5
13.2.3	Define Split Payment Patterns	13-7

13.3	Viewing and Editing Payment Pattern	13-8
13.4	Copying Payment Pattern	13-9
13.5	Deleting Payment Pattern	13-9

14 User Defined Repricing Patterns

14.1	Search Repricing Pattern	14-1
14.2	Create Repricing Patterns	14-2
14.2.1	Define Absolute Repricing Patterns	14-2
14.2.2	Define Relative Repricing Patterns	14-5
14.3	Viewing and Editing Repricing Pattern	14-7
14.4	Copying Repricing Pattern	14-7
14.5	Deleting Repricing Pattern	14-7

15 Behavior Pattern Rule

15.1	Create Behavior Pattern Rules	15-1
15.2	Defining Behavior Pattern Rule	15-2
15.3	Defining a Behavior Pattern Rule: An Example	15-3

16 Time Buckets

16.1	Creating Time Bucket Rules	16-2
16.2	Defining Time Bucket Rules	16-2

17 Default Product Profiles

17.1	Viewing a Seeded Product Profile	17-2
17.2	Creating Product Profiles	17-2
17.3	Summary of Seeded Product Profiles	17-3

18 Product Characteristics

18.1	Creating Product Characteristic Rules	18-1
18.2	Defining Product Characteristic Rules	18-2
18.2.1	Using Assumptions	18-4
18.2.2	All Business Tab	18-5
18.2.3	New Business Tab	18-7
18.2.3.1	Core Product Attributes Secondary Tab	18-10
18.2.3.2	Payment Attributes Secondary Tab	18-12
18.2.3.3	Adjustable Rate Attributes Secondary Tab	18-13
18.2.3.4	Negative Amortization Attributes Secondary Tab	18-15

18.2.3.5	Define Other Mortgage Attributes Secondary Tab	18-16
18.2.3.6	The Model Integration Secondary Tab	18-17
18.2.3.7	Define Inflation Adjustment Attributes Secondary Tab	18-18
18.3	Copying Assumptions Across Currencies and Products	18-20

19 Forecast Rates

19.1	Creating Forecast Rate Rule	19-1
19.2	Currency Forecast Methods	19-3
19.3	Economic Indicator Forecast Methods	19-5
19.4	Interest Rate Forecast Methods	19-6
19.5	ALM Volatility Codes	19-13
19.6	Behavior Pattern Rule Mapping	19-13
19.7	Editing a Forecast Rate	19-13
19.8	Data Loader Procedure	19-14

20 Prepayment Rules

20.1	Create Prepayment Rules	20-1
20.2	Defining Prepayment Methodologies	20-2
20.2.1	Defining Prepayments Using Node Level Assumptions	20-2
20.2.2	Defining Constant Prepayment Method	20-5
20.2.3	Defining Prepayment Model Method	20-7
20.2.4	Defining PSA Prepayment Method	20-9
20.2.5	Defining the Arctangent Calculation Method	20-10
20.3	Defining Early Redemption Assumptions	20-11
20.4	Associating Conditional Assumptions with Prepayment Rules	20-13

21 Prepayment Models

21.1	Create Prepayment Models	21-1
21.1.1	Procedure to Define the Structure of the Prepayment Model	21-1
21.1.2	Prepayment Rate Calculation	21-2
21.1.2.1	Prerequisites	21-2
21.1.2.2	Manual	21-2
21.1.2.3	Integrated Model	21-4
21.1.2.4	External Model	21-4
21.2	Editing Prepayment Models	21-6
21.3	Editing Prepayment Rates in a Prepayment Model	21-7
21.4	Prepayment Rate Data Loader	21-8

22 Prepayment Model Analysis

22.1	Searching for a Model Rule	22-4
22.2	Defining a Model	22-5
22.3	Editing Prepayment Model Analysis Rule	22-12
22.4	Copying Prepayment Model Analysis Rule	22-13
22.5	Deleting Prepayment Model Analysis Rule	22-13
22.6	Dependency Checking	22-14

23 Prepayment Rate Calculation Process

23.1	Creating a Prepayment Rate Calculation Process	23-1
23.2	Viewing Prepayment Rate Calculation Process	23-4
23.3	Editing Prepayment Rate Calculation Process	23-4
23.4	Copying Prepayment Rate Calculation Process	23-4
23.5	Deleting Prepayment Rate Calculation Process	23-4
23.6	Performance Tuning Prepayment Rate Calculation Processes	23-4
23.7	Executing a Prepayment Rate Calculation Process	23-4
23.7.1	UI Based Procedure	23-5
23.7.2	Batch Based Procedure	23-5
23.7.2.1	Simplified Batch	23-5
23.7.2.2	ICC Batch	23-6
23.7.2.3	Run Rule Framework	23-6

24 Non Maturity Products Model Analysis

24.1	Creating Non-Maturity Products Model	24-2
24.2	Searching for a Non-Maturity Products Model Analysis Rule	24-11
24.3	Editing Non-Maturity Products Model Analysis Rule	24-11
24.4	Copying Non-Maturity Products Model Analysis Rule	24-12
24.5	Deleting Non-Maturity Products Model Analysis Rule	24-12
24.6	Dependency Checking	24-13

25 Non-Maturity Products Data Creation Process

25.1	Creating Data Creation Process	25-3
25.2	Executing Data Creation Process	25-6
25.2.1	UI Based Procedure	25-7
25.2.2	Batch Based Procedure	25-7

26 Discount Methods

26.1	Creating Discount Method Rules	26-1
26.2	Defining Discount Method Rules	26-2
26.2.1	Discount Method	26-3
26.2.2	Cash Flow Definition Details	26-4
26.2.3	Cash Flow Interest Type	26-4
26.3	Interest Rate Parameters	26-5
26.4	Defining a Discount Methods Rule Using Spot IRC: An Example	26-5
26.5	Discount Rate Method Examples	26-6

27 Rate Dependency Patterns

27.1	Searching for Rate Dependency Patterns	27-1
27.2	Creating Rate Dependency Patterns	27-2
27.2.1	Defining Rate-Level Dependent Rate Dependency Patterns	27-3
27.2.2	Defining Rate-Spread Dependent Rate Dependency Patterns	27-5
27.2.3	Defining Economic Indicator Dependent Rate Dependency Patterns	27-5

28 Forecast Balance Rules

28.1	Forecasting Methods	28-1
28.2	Rate-Volume Modeling	28-6
28.3	Creating a Forecast Balance Rule	28-7
28.4	Editing the Defined Forecast Balance	28-10
28.5	Examples of Forecast Balance Assumptions	28-11
28.5.1	Rate Sensitive Rollover Example	28-11
28.5.2	Processing New Business in a Dynamic ALM Process	28-12

29 Forecast - Pricing Margins

29.1	Creating Pricing Margin Rules	29-1
29.2	Defining Pricing Margin Rules	29-2
29.3	Defining a Pricing Margin Rule: An Example	29-5

30 Forecast – Maturity Mix

30.1	Creating Maturity Mix Rules	30-1
30.2	Defining Maturity Mix Rules	30-2
30.3	Defining a Maturity Mix Rule: An Example	30-6

31 Transfer Pricing Rules

31.1	Creating Transfer Pricing Rules	31-1
31.2	Defining the Redemption Curve Methodology	31-2
31.2.1	Defining Transfer Pricing Methodologies	31-2
31.2.1.1	Defining Assumptions with the Default Currency	31-3
31.3	Associating Conditional Assumptions with Assumption Rules	31-11
31.4	Cash Flow: Average Life	31-12
31.5	Cash Flow: Duration	31-13
31.6	Cash Flow: Weighted Term	31-15
31.7	Cash Flow: Zero Discount Factors	31-17
31.8	Caterpillar	31-19
31.9	Copying Assumptions across Currencies	31-20
31.10	Defining Unpriced Account Methodology	31-21
31.11	Defining Tractor Methodology	31-22
31.12	Defining Transfer Pricing Methodologies Using Node Level Assumptions	31-22
31.13	Exceptions to Typical Calculations	31-25
31.14	Mid-Period Repricing Computations	31-26
31.15	Moving Averages	31-26
31.16	Overview of Transfer Pricing Methodologies and Rules	31-28
31.17	Redemption Curve	31-30
31.18	Spread from Interest Rate Code	31-31
31.19	Spread from Note Rate	31-32
31.20	Straight Term	31-32
31.21	Tractor Method	31-34
31.22	Transfer Pricing Methods and the Mid-Period Repricing Option	31-38
31.23	Transfer Pricing Rule Pane	31-38
31.24	Typical Calculations	31-39
31.25	Unpriced Account	31-41
31.26	Weighted Average Perpetual	31-42
31.27	Working with Transfer Pricing Rules	31-43

32 Adjustment Rules

32.1	Create Adjustment Rules	32-1
32.2	Defining Adjustment Methods	32-2
32.2.1	Availability of Adjustment Methods	32-4
32.2.1.1	Adjustment Method Parameters	32-5
32.3	Define the Use TP Method from TP Rule Method	32-8
32.3.1	Defining Assumptions with the Default Currency	32-10
32.3.2	Define the Formula Based Rate Adjustment Method	32-11

32.3.3	Define the Breakage Charge Economic Loss Method	32-11
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33 Transaction Strategies

33.1	Creating a Transaction Strategy Rule	33-1
33.2	Defining a Transaction Strategy	33-2
33.2.1	Defining an Off-Balance Sheet Transaction	33-3
33.2.2	Defining an On-Balance Sheet Transaction	33-5

34 Formula Results

34.1	Creating Formula Result Rules	34-3
34.2	Defining Formula Results Rules	34-3
34.2.1	Formula Expression block	34-6
34.3	Defining a Formula Results Rule: An Example	34-11
34.4	Formula Results Functions	34-12
34.4.1	Formula Expression block	34-13
34.4.2	Detailed Descriptions	34-18
34.4.3	Additional Functions	34-23

35 Stochastic Rate Indexing

35.1	Defining Stochastic Rate Indexes	35-1
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36 ALM Processing

36.1	Creating an ALM Process Rule	36-2
36.1.1	Creating a Static Deterministic ALM Process Rule	36-3
36.1.2	Creating a Static Stochastic / Historical Simulation Process Rule	36-8
36.1.3	Creating a Dynamic Deterministic Process Rule	36-12
36.1.4	Creating a Dynamic Stochastic / Historical Simulation Process Rule	36-17
36.2	Executing an ALM Process	36-21
36.2.1	Using UI	36-21
36.2.2	Using ICC Batch Framework	36-22

37 Andrew Davidson and Company (ADCo) Prepayment Method

37.1	Deployment of ADCo Libraries on OFSAAI	37-1
37.2	Procedure For Setting Up ADCo Process	37-2
37.2.1	Mapping of the ADCo function	37-3
37.2.1.1	Rate Management	37-3
37.2.1.2	Application Preferences	37-4

37.2.1.3	Product Characteristics	37-5
37.2.1.4	Forecast Rates	37-5
37.2.1.5	Prepayments	37-5
37.2.1.6	Transaction Strategies	37-6
37.2.1.7	ALM Processing	37-6
37.3	ADCo Mapping	37-7
37.4	Limitations	37-9

38 Moody's WSA Integration with OFS ALM

38.1	Deployment of Moody Libraries on OFS ALM	38-1
38.2	Moody's Integration – Considerations	38-2
38.2.1	WSA Engine and Processing of the Records	38-2
38.2.2	WSA Engine and OFSAA Rate Management	38-3
38.2.3	WSA Engine and OFSAA Product Characteristic Definition	38-3
38.2.3.1	Tuning Parameters	38-5
38.3	Setting-up a Moody's Process	38-6
38.4	Limitations	38-6

39 Data Aggregation and Stratification

39.1	Partial Aggregation	39-1
39.2	Stratification Action Operations	39-1
39.3	Aggregation Action Operations	39-2
39.4	Stratification Tips	39-2
39.5	Setting up Stratification Definitions	39-3
39.5.1	Stratification Configuration	39-3
39.5.2	Setting up Stratification Tier Structures	39-4
39.5.3	Setting up Stratification Definitions	39-5
39.5.4	Defining Stratification Rules	39-5
39.5.5	Defining Stratification Tiers	39-7
39.6	Creating New Aggregate Table	39-8
39.7	Executing a Stratification Rule	39-9
39.7.1	Using ICC Batch Framework	39-10
39.7.2	Using SQL* Plus to Execute a Stratification Rule	39-10

40 Metadata Browser

41 Performance Tuning

41.1	Application Process Tuning	41-1
41.1.1	Defining MultiprocessingParameters	41-1
41.1.1.1	Assignment Levels Details	41-4
41.1.1.2	Parameter Specification	41-5
41.1.1.3	Multiprocessing Options	41-7
41.1.2	Application Multiprocessing Model	41-9
41.1.3	Multiprocessing Options	41-10
41.1.4	Tuning Application Multiprocessing	41-14
41.2	Performance Tuning Applicable to FTP	41-15
41.3	Performance Tuning Applicable to ALM	41-16

42 Multi-Language Support

43 Archive-Restore

43.1	Command-line Migration	43-1
43.2	Command-line Migration Utility	43-1
43.2.1	Supported Objects	43-1
43.2.2	Input Values for OBJECTMIGRATION.xml	43-4

44 Interest Rate Risk in the Banking Book (IRRBB)

44.1	Amenability Category	44-2
44.2	Retail/Wholesale and Transactional Non-Maturing Deposits	44-2
44.3	Option Valuation	44-3
44.4	Deposit Penalty for Early Withdrawal	44-3
44.5	Identify Intra and Inter-Company Accounts	44-4
44.6	Behavior Pattern Loader	44-4
44.7	Material Currency	44-4

45 Common Utilities and Scripts

46 Standard Navigation Paths

47 Oracle ALM Error Messages

48 Glossary

48.1 List of Glossary

48-1

Index

1

About This Content

This guide provides information on the Oracle Financial Services Asset Liability Management Application (OFS ALM).

Audience

This guide is intended for the users of Oracle Financial Services Asset Liability Management Application (OFS ALM).

Documentation Accessibility

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

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

Related Resources

See these Oracle resources:

- [Oracle Financial Services Release Notes](#)
- [Oracle Financial Services Installation and Configuration Guide](#)
- [Oracle Financial Services Asset Liability Management Analytics User Guide](#)
- [Oracle Financial Services Analytical Applications Data Model Utilities User Guide](#)
- [Oracle Financial Services Cash Flow Engine Reference Guide](#)

Conventions

The following text conventions are used in this document.

Table 1-1 Conventions

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	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, text that appears on the screen, or text that you enter.

2

What is New in This Release for ALM Application

Oracle Financial Services Asset Liability Management release v8.1.2.2.0

This section lists new features and changes in Oracle Financial Services Asset Liability Management release v8.1.2.2.0.

- **Stratification Support for Partial Aggregation:** Stratification Engine now supports Partial Aggregation. If Customers want to aggregate the accounts falling only under Tier criteria but want to move left over accounts as is from source to destination table without aggregation, they can do the same. Also, a new check-box (Apply Column Mapping for Non Aggregated Accounts) is introduced to choose to apply column mapping given in the Aggregation tab or not.
- **Non-Maturity Model:** User selects a projection period over which current balance will be decaying and eventually become zero. Sometime, at the end of projection period there is some left over balance, calculations are enhanced to account for this left over balance as well, while calculating instrument's weighted average life.

Oracle Financial Services Asset Liability Management release v8.1.2.0.0

This preface lists new features and changes in Oracle Financial Services Asset Liability Management release v8.1.2.0.0.

- **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 pattern based on model outputs like how much is core, how long core will be available based on 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 Modeling section.
- **Cash Flow Edits:** A redesigned Cash Flow Edits is available to check quality of input data and cleanse it. In addition to a fresh user interface, rules are categorized into multiple groups/sub-groups. User can select one or more group/sub-group to execute on the selected data. For a customer upgrading from prior release of ALM, both old and new Cash Flow Edits are available to maintain continuity. A fresh installation of ALM 8.1.2.0.0 will only have the new Cash Flow Edits. Overtime, all customers are expected to move to the new version.

Note:

Source table selected in Cash Flow Edits Process must contain unique index. Execution will fail if unique index is not present in table.

For more information, see the Cash Flow Edits section.

- **Hybrid Curve IRC:** New curve types added - Custom Weighted Average, Maximum, and Minimum.
For more information, see the Interest Rates section.
- **Discount method to include EIR:** EIR is now included as a discount method in the Discount rule.
For more information, see the Discount Methods section.
- **IRRBB Fixed Margin cash flow:** Interest Rate Gap has been enhanced to include the margin cashflow post reprice of an instrument to maturity via new financial elements.
For more information, see the IRRBB section.
- **IRRBB Scalars:** Added a user interface in Calculation Elements to access Standardized Approach parameters including shock amounts by currency and prepayment/early redemption scalars.
For more information, see the ALM Processing section.
- **Prepayment Rule - User Defined Tenor:** Ability to add a prepayment model to the user defined tenors in a prepayment rule is now supported.
For more information, see the Prepayment Rules section.

3

Introduction to Oracle Asset Liability Management

This chapter introduces Oracle Asset Liability Management and discusses its place in the Oracle Financial Services Analytical Applications (OFSAA) group.

Topics

- [Overview of Oracle Financial Services Asset Liability Management](#)
- [Oracle Asset Liability Management and Other Oracle Financial Services Applications](#)

3.1 Overview of Oracle Financial Services Asset Liability Management

Oracle Financial Services Asset Liability Management (OFS ALM), helps financial services institutions measure and monitor Interest Rate Risk, Liquidity Risk, and Foreign Currency Risk. This solution measures and models every loan, deposit, investment, and portfolio individually, using both deterministic and stochastic methods. OFS ALM is a next-generation solution fully integrated with Oracle's Financial Services Analytical Applications and shares a common account level relational data model.

With this versatile forecasting tool, powerful analytical functions can be modeled for every instrument, including derivatives and embedded options. Modeling at the account level of detail (loan-by-loan and deposit-by-deposit) provides highly accurate modeling results. Flexible assumption rules and reporting structures support a wide range of analytical power.

Release 8 of OFS ALM includes rate-dependent business rules and improvements to derivative forecasting capabilities. You can define forecast assumption rules that leverage rate dependency patterns allowing you to dynamically model a range of portfolio characteristics that are dependent on the specific scenario being executed. Derivative instrument forecasting is directly supported through Transaction Strategy rules. Within Transaction Strategies, you can now select the derivative type and define the characteristics that apply to the specific derivative instrument being modeled

3.1.1 Oracle Asset Liability Management Key Benefits

Oracle Financial Services ALM is designed to model balance sheets under a variety of rate environments. Oracle Financial Services ALM functionality uses several key concepts and has evolved from the continual iterations of building simulated management processes. The basis of Oracle Financial Services ALM functionality includes:

- A wealth of output information. OFS ALM calculates and stores a variety of financial risk indicators including, VaR, EaR and related probability distributions; static and dynamic market value, duration and convexity; static and dynamic Gaps based on both repricing and liquidity bucket definitions; income simulation capabilities.
- Rigorous Calculations. OFS ALM 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.

- A flexible time horizon and free-form timing bucket increments for reporting are 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.
- An unconstrained batching of scenarios, with flexible assumptions sets, is required to achieve an effective and efficient analytical process.

3.1.2 Oracle Asset Liability Management and Other Oracle Financial Services Applications

Oracle Financial Services Asset Liability Management (OFS ALM) operates on top of a common infrastructure, 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.

3.1.3 Oracle Financial Services Enterprise Performance Management

More than ever, financial institutions, their regulators and 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.

3.1.3.1 OFSAA Data Model

OFSAA Data Model 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 individual business applications.

3.1.3.2 OFSAA Infrastructure

OFSAA Infrastructure is the platform for OFSAA. It provides support for User Administration, Metadata Management, a Processing Framework, a Forms Framework, and additional capabilities necessary to support the individual business applications.

3.1.3.3 OFS Funds Transfer Pricing

Oracle Financial Services Funds Transfer Pricing (OFS FTP) 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 every each customer relationship. This enables accurate assessment of profitability along the 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 the interest margin offers tremendous profit opportunities. By separating the components of net interest income, OFS FTP 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.

3.1.3.4 OFS Profitability Management

Oracle Financial Services Profitability Management enables financial services institutions to calculate profitability through the 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 the profitability, senior management must give them the power to identify the products that are profitable in each market segment, for each customer.

Together with OFS FTP, OFS PFT 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, OFS PFT delivers complete, accurate, and inclusive profiles of profitability.

3.1.3.5 OFS Pricing Management, Transfer Pricing Component

Oracle Financial Services Pricing Management, Transfer Pricing Component 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.

3.1.3.6 OFS ALM

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 (OFS 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 OFS 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.

3.1.3.7 OFS BSP

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 several unique requirements 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 the 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 forecast and comprehensive, meaningful budgets.

3.1.3.8 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.

3.1.3.9 Oracle Asset Liability Management Integrations

Oracle Asset Liability Management integrates with the following modules:

- Oracle Financial Services Asset Liability Management Analytics
- Oracle Financial Services Balance Sheet Planning
- Oracle Financial Services Funds Transfer Pricing

A robust and flexible Asset Liability Management process is merely the beginning. Oracle Financial Services Asset Liability Management Analytics (OFS ALMBI) is a fully integrated business intelligence application leveraging Oracle's industry-leading BI technology. OFS ALMBI contains ALM specific dashboards and reports providing a ready-to-use reporting solution that allows you to rapidly deploy your OFS ALM solution and quickly realize a significant return on your investment.

You can also integrate OFS FTP business rules into Oracle Financial Services Asset Liability Management to project transfer pricing results into your forecasting process.

3.1.3.10 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 the 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.

4

Overview of OFSAA Infrastructure

OFSAA Infrastructure includes facilities for creating and maintaining:

- Dimensional reference data
- Interest rate & currency exchange rate data
- Process tuning data

OFSAA Infrastructure also includes functionality for building and maintaining rules that may be used by any Oracle Financial Services Analytical Application. These common rule objects include:

- Expressions
- Hierarchies
- Filters

Topics:

- [OFSAA Infrastructure](#)
- [Overview of Dimensionality in OFSAA](#)
- [Rollup Members for Dimensions Supporting Hierarchies](#)
- [Dimension Types](#)
- [Attributes](#)
- [OFSAA Rules](#)
- [OFSAA Filters](#)
- [OFSAA Expressions](#)
- [Folders](#)
- [Visibility of Rules](#)
- [Access Type](#)
- [Application Preferences](#)
- [Global Preferences](#)
- [System Configuraton](#)

4.1 Overview of Dimensionality in OFSAA

Dimensions are used to stratify your business data for processing or reporting purposes. For example, at a minimum General Ledger systems are typically stratified by a General Ledger dimension, an organization or cost center dimension, and a time dimension. Customer account level data will normally have these same dimensions but are often additionally segmented by dimensions such as Product or Customer. You may wish to construct models using a specialized product dimension or other customized dimensions such as geography, cost pool, transaction, activity or channel.

Dimensions are comprised of lists of members. For example, the Organizational Unit dimension might be comprised of Branch #1, Branch #2, Branch #3, etc. Some dimensions may contain tens or even hundreds of thousands of members (for example, a large organizational or customer dimension) while others may contain as few as two members (for example, a simple product-type dimension with values of Fixed and Variable).

The member values or "Chart of Accounts" for each dimension may be maintained either internally within the OFSAA Infrastructure or externally

Internally

OFSAA Infrastructure includes functionality for Adding, Viewing, Editing, or Deleting dimension member values. Which of these functions you can access depends on your logon privilege and on the dimension with which you wish to work. For details, on the creation and maintenance of Dimension Members, refer to the Oracle Financial Services Analytical Applications Infrastructure User guide.

Externally

You may choose to source and maintain some Charts of Accounts from external systems such as your General Ledger, a Data Warehouse, or from some other external master data management system. For more information, see the [Oracle Financial Services Analytical Applications Data Model Utilities User Guide](#).

Combination

You may also choose to maintain some Chart of Account values from an external source while maintaining other Chart of Account values internally.

4.2 Referential Integrity

You may have dimension member values defined in your Chart of Accounts that do not exist in your business data, particularly if the dimension member values are used as attribute values (see discussion of attributes below). But you would never want to have an occurrence of a dimension member value in your business data that did not exist in the dimension's Chart of Accounts. When you load business data into OFSAA, you need assurance that there are no dimension member values present in the business data that are not defined in your Chart of Accounts. For details on ensuring referential integrity between your business data and your Chart of Accounts data, see the [Oracle Financial Services Analytical Applications Infrastructure \(OFSAAI\) Installation and Configuration Guide](#).

4.3 Dimension Attributes

Some OFSAA dimensions support attributes. Dimension attribute values are used to qualify dimension members. For example, a cost center, say Branch #1, might have a Headcount attribute with a value of 32 and a Volume attribute with a value of High. A product dimension member, say 30-year fixed-rate jumbo LIBOR mortgage, might have a Rate attribute with a value of LIBOR, a Size attribute with a value of Jumbo, and a Loan Type attribute of Fixed. A General Ledger account, say Benefit Expense, might have an Account Type attribute with a value of Non-Interest Expense.

Like dimensions, attributes are used to stratify your business data for processing or reporting purposes. Some dimension attributes are seeded within the OFSAA data

model and are used extensively in processing. You may define as many user-defined attributes as you need.

OFSAA Infrastructure includes functionality for Adding, Viewing, Editing, or Deleting dimension attributes. Which of these functions you can access depends on your logon privilege and on the dimension with which you wish to work.

Once an attribute has been defined for a dimension, attribute values may be assigned to individual dimension member values. These attribute values may be open-ended (dates, numbers, or strings) or may be restricted to a defined set of members.

4.4 Hierarchies

Some OFSAA dimensions support hierarchies. Hierarchies may be used to provide sophisticated stratification for either processing or reporting purposes. For example, an organizational hierarchy might start with a Division level containing Western Region, Eastern Region, and Southern Region; the next level down within the hierarchy might be state or county. A product hierarchy might begin with branches for Asset vs. Liability vs. Service products; under the Asset branch, you might define additional branches for Mortgage Lending, Commercial Lending, Consumer Lending, and so on. Hierarchies are used extensively in OFSAA models to assign methods to products and to support allocation methodologies.

Like dimension members, dimension hierarchies may be maintained either internally within the OFSAA Infrastructure or externally.

Internally

OFSAA Infrastructure includes functionality for Adding, Viewing, Editing, or Deleting hierarchies. Which of these functions you can access depends on your logon privilege and on the hierarchy with which you wish to work.

Externally

You may choose to source and maintain some or all of your hierarchies from external systems such as your General Ledger, a Data Warehouse, or from some other external master data management system, such as Oracle Data Relationship Management (DRM). For more information on loading hierarchy data from external systems, see the [Oracle Financial Services Analytical Applications Data Model Utilities User Guide](#).

Combination

You may also choose to maintain some hierarchies from an external source while maintaining other hierarchies internally.

4.5 Rollup Members for Dimensions Supporting Hierarchies

For dimensions that support hierarchies, every dimension member value has the property of being either a **leaf** value (child-only or last descendent child value) or a **rollup node** value. For example, if Branch #1, Branch #2, and Branch #3 all belonged to the West rollup point of an organizational hierarchy, then West would also be a dimension member value of the Organizational Unit dimension. Your business data is typically expressed at the leaf level.

4.6 Dimension Types

OFSAA supports the following three fundamentally different kinds of dimensions:

- Key Processing Dimensions
- Standard Dimensions
- Simple Dimensions

4.6.1 Key Processing Dimensions

Key Processing Dimensions have the following features:

- Accessible as modeling dimensions for all of the OFSAA analytical engines.
- Expressed as columns in nearly all of your business fact tables.
- Support both attributes and hierarchies

Metadata for Key Processing Dimensions are stored in four tables:

- A base table (For example, DIM_PRODUCTS_B)
- A translation table (For example, DIM_PRODUCTS_TL)
- An attribute table (For example, DIM_PRODUCTS_ATTR)
- A hierarchy table (For example, DIM_PRODUCTS_HIER)

Base tables store basic information about each dimension member and translation tables store names and descriptions for each dimension member in multiple languages. Attribute tables store one or many attribute values for each dimension member. Hierarchy tables store one or more hierarchies for each dimension (you may define as many hierarchies as you wish for any dimension that supports hierarchies).

Seeded Key Processing Dimensions

OFSAA is seeded with six Key Processing dimensions:

- Financial Element
- Organizational Unit
- General Ledger Account
- Common Chart of Accounts
- Product
- Legal Entity

Among the six seeded Key Processing dimensions, only the Financial Element dimension is pre-populated with a Chart of Accounts, but it is only populated in the range between 0 and 10,000 (For more details on the seeded Chart of Accounts for the Financial Element dimension see the [Oracle Financial Services Profitability Management User Guide](#). This is a reserved range in which you may not add new members, or edit or delete existing members. You may add user-defined Financial Elements anywhere outside the reserved range.

User-Defined Key Processing Dimensions

For more information on adding your own user-defined Key Processing dimensions, see the [Oracle Financial Services Analytical Applications Infrastructure \(OFSAAI\) Installation and Configuration Guide](#).

4.6.2 Standard Dimensions

Standard dimensions may support attributes and/or hierarchies depending on how they are configured, but are not used as processing dimensions within any of the analytical application engines. Like Key Processing Dimensions, metadata for Standard Dimensions is stored in a base table and in a translation table. A Standard Dimension may or may not have an attribute table or a hierarchy table depending it is configured. Within the OFSAA modules, Standard dimensions that are defined as having a hierarchy table will support hierarchies, and Standard dimensions that are defined as having an attribute table will support attributes. See the [Oracle Financial Services Analytical Applications Infrastructure \(OFSAAI\) Installation and Configuration Guide](#).

Seeded Standard Dimensions

OFSAAI is seeded with two Standard Dimensions

- Country
- Customer

Both dimensions support attributes and hierarchies. Default member values are provided for the Country dimension, but no values are provided for the Customer dimension.

User-Defined Standard Dimensions

Refer to the Oracle Financial Services Analytical Applications Infrastructure (OFSAAI) Installation and Configuration Guide for details on adding user-defined Standard dimensions.

4.6.3 Simple Dimensions

Sometimes referred to as Code dimensions, Simple dimensions are a "list of values" that support neither attributes nor hierarchies. Their three key uses are:

- Reserved for use within the analytical application engines
- Stratifying your data for process or report filtering purposes
- Serving as the **list of values** when used as attributes

The OFSAA Data Model comes with more than 150 seeded Simple dimensions. Many of these seeded Simple dimensions are also seeded with dimension members. Unlike Key Processing dimensions and Standard dimensions, Simple dimensions are stored in two tables:

- A code table (For Example, AMRT_TYPE_CD)
- A Multi-Language Support or MLS table (For Example, AMRT_TYPE_MLS)

Simple Dimension "Process Identifier Code" helps to improve CFE process execution performance by skipping VALIDATE_NODE_MAP_CFE package execution incase there is no change in underlying metadata while running CFE Process everytime. There is no direct method to identify whether any change in underlying data at the node level and one need to execute VALIDATE_NODE_MAP_CFE and thats where the "Process Identifier Code" Simple

Dimension takes place. This dimension should contain the list of process Ids for which there is no change in underlying node level metadata hence no need to run VALIDATE_NODE_MAP_CFE everytime the process is run. In turn whenever CFE Engine is run; it checks the currently considered process id and checks its existence in FSI_PROCESS_IDENTIFIER_CD table; if present then ignores VALIDATE_NODE_MAP_CFE procedure run.

4.6.3.1 Reserved Simple Dimensions

Accrual Basis Code is an example of a seeded Simple dimension that is used extensively by the application modules. It is seeded with a small list of values (such as 30/360, Actual/360, Actual/Actual, and so on.) and its value set may not be modified.

Amortization Type Code is another example of a reserved Simple Dimension. Amortization Type Code is populated with reserved values that the Cash Flow engine interprets, and its value set may not be modified. Many other Simple Dimensions are reserved and may not be modified.

4.6.3.2 Simple Dimensions Used for Processing or Reporting Purposes

This kind of Simple Dimension cannot be used directly by the application engines, but they are accessible to OFSAA Filter rules.

Credit Rating is an example of a seeded Simple Dimension that may be used for processing or reporting purposes. You may, for example, wish to allocate risk equity to individual instruments as a function of Credit Rating. The seeded values for Credit Rating are Moody's credit ratings, but you are free to completely redefine the membership of this dimension. Geographic Location is another example. Geographic Location is pre-populated with the US States and Canadian provinces, but you are free to completely redefine the completely geographic locations.

4.6.3.3 Simple Dimensions Used as Attribute Domains

Both seeded and user-defined attributes often utilize a Simple Dimension to provide a list of values. For example, you might create an Adjustable Type attribute on your Product dimension and you might want this attribute to be limited to the values of Fixed, Variable, or Administered. In this case, you might first build a Simple Dimension called Type whose dimension members were limited to three values: Fixed, Variable, or Administered. Next you could assign the Type dimension to be the domain of your new Adjustable Type attribute.

See [Oracle Financial Services Analytical Applications Infrastructure \(OFSAAI\) Installation and Configuration Guide](#).

4.7 Attributes

OFSAA Infrastructure includes functionality for Adding, Viewing, Editing, or Deleting dimension attributes. Which of these functions you can access depends on your logon privilege and on the dimension with which you wish to work.

The seeded OFSAA Key Processing Dimensions have a number of seeded or seeded & required attributes. For example, the Common Chart of Accounts dimension includes an Account Type attribute and an Accrual Basis attribute; the Financial Element dimension includes an Aggregation Method attribute. Some of these attributes have important implications in processing within OFSAA.

You may add Attributes to any Key Processing Dimension or to any Standard Dimension that supports Attributes (see sections above describing Key Processing Dimensions and Standard Dimensions).

One of the important properties of an Attribute is its Data Type. OFSAA Infrastructure supports Dimension Attribute Data Types of:

- Date, String, or Number
- Dimension

4.7.1 Unbounded and Bounded Attribute Data Types

Dimension attribute data types may be either bounded or unbounded. The Date, String, and Number types are unbounded, that is, there is no predetermined set of attribute values. A Date attribute value may be any valid date, a String attribute value may be any string up to 30 characters in length, and a Number attribute value may be any number. Examples of these kinds of attribute data types might include:

- Cost Center Open Date (a Date attribute on the Organizational Unit dimension)
- Product Memo (a String attribute on the Product dimension)
- Cost Center Headcount (a Number attribute on the Organizational Unit dimension)

Unlike attributes having the Date, String, or Number data type, attributes whose data type is Dimension have defined sets of values. For example, the Product dimension has a seeded attribute called Accrual Basis the data type of which is Dimension. The Accrual Basis dimension is seeded with 8 values. Accrual Basis is a restricted dimension (you may View Accrual Basis dimension members but you may not delete them or add new accrual bases), but whenever you assign an Accrual Basis attribute value to one of your Product dimension member values, you must select from the list of 8 available Accrual Bases.

4.8 Overview of OFSAA Rules

OFS Analytical Application models are constructed using combinations of OFSAA rules. For example:

- An Allocation rule might utilize a Hierarchy Filter rule, an Expression rule, and a Static Table Driver rule
- A Transfer Pricing rule might utilize a Hierarchy rule, a Data Element Filter rule, and a Prepayment rule
- A Data Element Filter rule might utilize an Expression rule
- A Group Filter rule always incorporates one or more underlying Data Element Filter rules
- Hierarchy Filter rules always utilize an underlying Hierarchy rule

The advantage of constructing models from discrete rule components is that individual rules may be re-used dozens or even hundreds of times. For example, if you wish to build a large series of allocation rules which operate on non-interest expense data in the Western region, you may build filters for (1) non-interest expense and (2) the Western region and then utilize these filters in every allocation rule. As another example, if you wanted to assign the same transfer pricing method and assumptions to all mortgage products, you could build a Hierarchy on the product dimension containing a Mortgage Products rollup point and assign your method and assumptions at the rollup level. You could subsequently utilize the same Hierarchy rule for allocation processing or reporting purposes.

Many rule types are specific to individual analytical applications (For example, Transfer Pricing rules, Cash Flow Engine rules, Allocation rules, and so on.) while OFSAA Infrastructure rules are shared across all OFS applications. Rule types that are shared across all applications include:

- Hierarchies
- Hierarchy Filters
- Data Element Filters
- Group Filters

Dimensions, dimension members, attributes, and currency exchange rates are also shared across all applications.

4.8.1 Dependencies

OFSAA rules often depend on other rules for some or all of their data or usefulness. For example, an Allocation rule may depend on a Data Element Filter rule to select and focus data in a meaningful way. If that Data Element Filter is deleted, then the Allocation rule becomes unusable. OFSAA applications track such dependencies and ensure that users may not delete rules that are consumed by other rules. Additionally, rule summary screens that present lists of rules that you have defined, offer functionality for you to generate reports on rule interdependency.

4.9 OFSAA Filters

OFSAA Infrastructure supports three kinds of filtering:

- Data Element Filters
- Group Filters
- Hierarchy Filters
- Attribute Filters

Data Element Filters

Data Element Filters are used to select and focus data. For example, you may transfer price some financial instruments at their source and may therefore wish to ensure that you do not overwrite the transfer rates for any instruments that already have a non-zero transfer rate. In such a case, you could construct a Data Element Filter to isolate only those instruments having a non-zero transfer rate. As another example, you may wish to allocate a charge to demand deposit accounts having small balances. In this case, you could construct a Data Element Filter to focus on just those instrument records having balances less than your chosen threshold.

Group Filters

Group Filters are used to join together one or more Data Element Filters. For example, if you built one Data Element Filter that focused on balances less than 10,000 and a second Data Element Filter that focused on accounts whose origination date was prior to 2009, a Group Filter built on the two Data Element Filters would focus on accounts with balances less than 10,000 AND whose origination dates were prior to 2009.

Hierarchy Filters

Hierarchy Filters allow you to focus on data that rolls up to one or more points within a chosen hierarchy. You may also focus on "leaf" level data or a combination of "leaf" level and rollup levels. For example, if your organization had a Western, Northern, Southern, and Eastern division, you could construct a Hierarchy Filter that focused on data belonging to branch 1, 2, or 7 within the Eastern division plus any data belonging to the Northern division.

Attribute Filters

Attribute Filters allow you to filter on any dimension attribute values including standard, seeded attributes such as Account Type or Accrual Basis as well as on user-defined attributes.

4.10 OFSAA Expressions

Expressions represent formulas for combining data from your data model (For example, Column A divided by Column B times Column C). The results of Expressions may be invoked within a number of OFSAA rule types (For example, Data Element Filters, Allocation rules, and so on).

4.11 Folders

One of the fundamental properties of any OFSAA rule is the Folder in which it is stored. Your System Administrator will configure your user ID to have access to one or more folders in which you can store your rules. Your access rights will likely be similar to co-workers who have a similar business role. For details on security management and defining Segment Maintenance in OFSAA, refer to Oracle Financial Services Analytical Applications Infrastructure User Guide.

Storing rules in folders gives you the means to segregate your rules for functional or security considerations. For example, you may wish to:

- Set up folders to store Transfer Pricing rules that are separate from folders you have built for Profitability Management rules and that are also separate from folders you have built for Asset/Liability Management rules
- Establish some folders for rules you are in the process of developing and testing and other folders for fully tested, production-ready rules
- Segregate some rules that are fundamental to the definition of other rules (For example, some Data Element Filters may be used in dozens or hundreds of other rules) to ensure that access to those fundamental rules is highly controlled
- Segregate your hierarchies, which are also frequently fundamental to OFSAA models, into a restricted-access folder

4.12 Visibility of Rules

Every navigation path to view a rule in OFSAA begins with a Summary screen. Within the Summary screen for each rule type, a user may browse through all of the rules that are stored within Folders to which the user has access. From each Summary screen, users may be granted the ability to Add, Edit, View, or Delete rules.

When building rules in an OFS Analytical Application, you frequently call upon other OFSAA rules (For example., a Data Element Filter nested within an Allocation rule or a Hierarchy utilized within a Transfer Pricing rule). When nesting a child rule within a parent rule you must specify the child rule by its Name and Folder (where both Name and Folder are presented in drop-down list boxes). In this context, the Folder drop-down list box for every user will include every Folder in the Information Domain regardless of his Folder access rights. This means that a user may invoke a child rule from any Folder even if he cannot access that child rule directly through its Summary screen.

Additionally, whenever a user nests a parent rule within a child rule, the OFSAA user interface provides the user the ability to view a read-only version of the underlying child rule.

4.13 Access Type

Another fundamental property of every OFSAA rule is its Access Type.

Access Type may be set to either Read/Write or Read Only. Only the "creator" or "owner " of a rule may modify the rule if it is set to Read Only. The user ID under which a rule is initially built is the owner of a rule. You may modify a rule that you do not own provided that:

- The rule has been stored with the Read/Write access type
- You have been granted Edit privilege for the rule's type
- You have been granted access to the Folder in which the rule is stored

Again, for details on security management in OFSAA, refer [Oracle Financial Services Cash Flow Engine Installation and Configuration Guide](#) .

4.14 Application Preferences

In addition to Global Preferences, each of the OFS Analytical Applications has its own local application preferences. In the same way as in Global Preferences, Application Preferences (for each application) employs a "delegation" model that allows Administrators to set some preference items for all users while allowing non-administrative users to personalize other preference items.

Normally, you will set Application Preferences for yourself, but if you are logged in as an Administrator, you may set Application Preferences for all users of an application. When setting preferences for all users, you may restrict the ability of non-Administrators to change an Application Preference item by deselecting the **Is Editable** check box. If a preference item for a non-administrative user is defined as **not editable**, a user who is not an Administrator will inherit the value of the preference item that his Administrator has set for him and he will not have the ability to change it for himself.

While most Application Preferences items are unique to the application to which they belong, two properties are common to Application Preferences for each of the OFS Analytical Applications: Folder Name and Access Type.

Having the Folder Name and Access Type properties set at the application level allows you to have a different default Folder and Access Type for each OFS Analytical Application. Within the Left Hand Side or LHS menu, all OFSAA Infrastructure rules (Hierarchies, Filters, and Expressions) are maintained under Master Maintenance.

Since Folder and Access Type are not Global Preference items, a user must select one application's set of Application Preferences to be **Active** to govern the default values of Folder and Access Type for Oracle Financial Services Analytical Applications Infrastructure rules. This is done by selecting one of your Application Preference sets to be the one that is **Active for Master Maintenance**.

4.15 Global Preferences

Clicking Global Preferences invokes the Global Preferences screen. Global Preferences items are used to configure your user interface. Here, you set your default application language and date format, and your desired Pagination Records. Pagination Records determine how many rows will be displayed on summary screens. If you select Pagination Records to be 25 records, then any screen displaying results in a tabular format will display a maximum of 25 records. To see the next set of 25 records, you can use the Next VCR button.

Functional Currency and Signage are installation-time parameters that may not be reset in Global Preferences.

Functional Currency is defined as the currency of the primary economic environment in which an entity conducts its business. For details on signage, see the Oracle Financial Services Analytical Applications Profitability Management User Guide.

Normally, you will set preferences for yourself, but if you are logged in as an Administrator, you may set Global Preferences for All Users. When setting preferences for All Users, you may restrict the ability of non-Administrators to change a Global Preference item by deselecting the Is Editable check box. If a preference item is defined as not editable, a user who is not an Administrator will inherit the value of the preference item that his Administrator has set for him and he will not have the ability to change it for himself.

4.16 System Configuration

Application

Starting 8.0 release, once an application pack is installed, you can use only the Production or Sandbox information domain, created during the installation process. Though there is an option to create a new Information Domain, there is no menu to work with the frameworks on this new information domain. This new information domain then created acts only as a Sandbox Infodom. The Create New Application feature allows you (System Administrator) to create a new Application other than the standard OFSAA Applications and associate the standard/default platform framework menu with it, thereby enabling the new application for usage. The standard platform framework menu is seeded and rendered.

For more information, refer to System Configuration section in [Oracle Financial Services Analytical Applications User Guide](#)

5

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

5.1 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 5-1 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

5.1.1 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.

5.2 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 Details** 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.

5.2.1 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 5-2 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.

5.2.2 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

5.2.2.1 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 cannot 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 navigating 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.

5.2.2.1.1 Attributes Tab

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

Figure 5-3 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.

5.2.2.1.2 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 5-4 Terms Tab on Interest Rate Code window

The screenshot shows the 'Terms' tab of the Interest Rate Code window. The window has a header with tabs: 'Attributes', 'Terms', 'Historical Rates', 'Parameters', and 'Hybrid Term Structure'. The 'Terms' tab is selected. Below the header is a table with two columns: 'Term' and 'Multiplier'. The table contains one row with the value '1' in the 'Term' column and 'Months' in the 'Multiplier' column. Below the table is an 'Apply' button. At the bottom of the window are 'Save' and 'Cancel' buttons.

Term	Multiplier
1	Months

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**.

5.2.2.1.3 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.

5.2.2.1.4 Historical Rates Tab on Interest Rate Code window

The Historical Rates Tab pane on the Interest Rate Code window allows you to see the historical rates available for the interest rate code that is being created.

Figure 5-5 Interest Rate Code window - Historical Rates Tab

Effective Date	10 Months	20 Months	35 Months	Rate Data Source
04/13/2018	3.000000	6.000000	10	UR
04/13/2018	5.000000	7.000000	15.000000	UR

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 Copy or Paste
- Deletion of Historical Rates
- Data Input Helper

5.2.2.1.5 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.

5.2.2.1.6 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.

5.2.2.1.7 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.

5.2.2.1.8 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).

5.2.2.1.9 Deletion of Historical Rates

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

5.2.2.1.10 Generate Graph

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

To generate a graph, follow these steps:

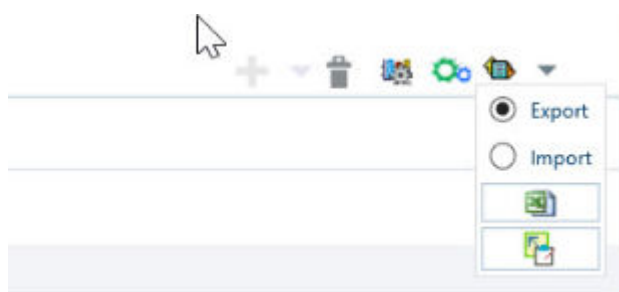
1. Select the Effective Date Range on the Historical Rates tab. The From Date and To Date fields will be automatically updated after selecting the Effective Date Range.
2. Select the Effective Date using the corresponding **Calendar** icon.
3. Enter the term points in respective fields and click **Apply**.
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.

5.2.2.1.11 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.

To export the data, follow these steps:

1. **Excel Export:**
2. On the Interest Rates toolbar, click the **Excel** icon.
3. 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.

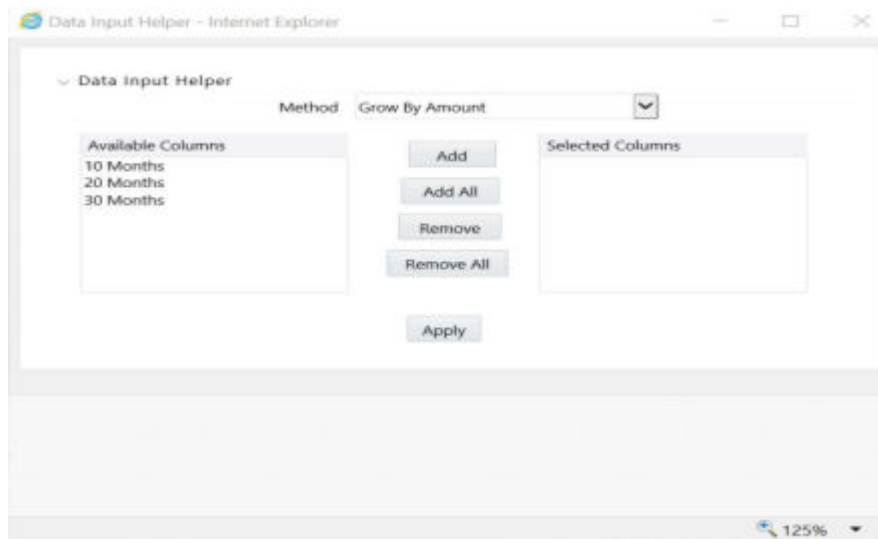
Figure 5-6 Export and Import options for Historical Rates data

- 4. 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.
- 5.** If appending data that pre-existed for the same effective date, the import will overwrite existing data.
- 6.** 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 5-7 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.

5.2.2.2 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

5.2.2.2.1 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 5-8 Parameters Tab on Interest Rate Code window

Effective Date	Term Structure Model	Mean Reversion Speed	Long Run Rate	Volatility	Rate Data Source
08/25/2020	Extended Vasicek	0.000000	0.000000	0.01	UI <input type="button" value="Calc"/>

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 **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 needed by the models:

Table 5-1 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.

Table 5-2 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.

5.2.2.3 Hybrid Term Structure Tab

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

- Spread
- Moving Average
- Merge

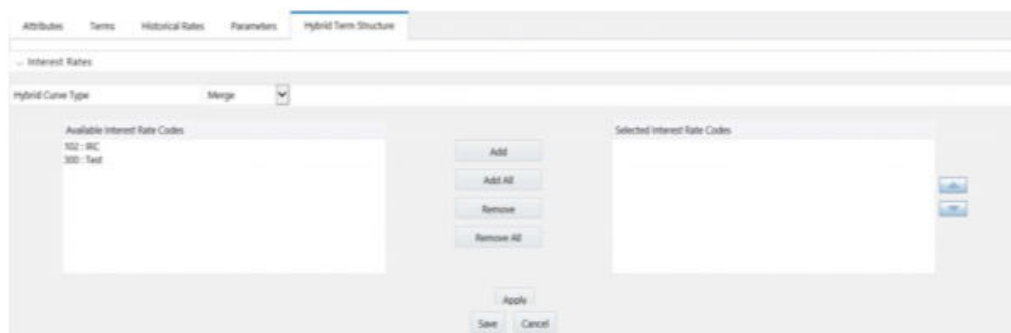
Note:

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.

Figure 5-9 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.

5.2.2.3.1 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**.

5.2.2.3.2 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.

5.2.2.3.3 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 through an 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.

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.

5.2.3 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'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**:

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.

5.2.3.1 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**.

(Optional) <Enter a step example.>
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.

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

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

5.2.3.2 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, follow these steps:

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.

5.3 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**, select **Rate Management**, and then select **Currency**. This page displays a comprehensive list of more than 170 seeded ISO currency codes.

5.3.1 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).

5.3.2 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**.

5.3.3 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.

5.3.4 Deleting Currencies

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

5.4 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 (OFS FTP) Ledger Migration processes
- OFS Asset Liability Management (OFS ALM) 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.

5.4.1 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 5-10 Currency Rates Summary page

The screenshot shows the 'Currency Rates Summary' page. At the top, there is a 'Currency Selection' section with several dropdown menus and date pickers. 'From Currency' is set to 'US Dollar', 'To Currency' is 'Bermudian Dollar', 'Rate Type' is 'Floating Rate', 'From Date' is '06/27/2021', and 'To Date' is '07/27/2021'. Below this is the 'Floating Currency Rates' section, which displays a table with the following columns: 'Effective Date', 'USD', 'Status', and 'Data Source Code'. The table contains one blank row. Below the table are 'Save' and 'Cancel' buttons.

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.

5.4.2 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 5-11 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.

Table 5-3 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

5.4.3 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**.

5.4.4 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.

5.4.5 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.

5.4.6 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**.

5.4.7 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?*

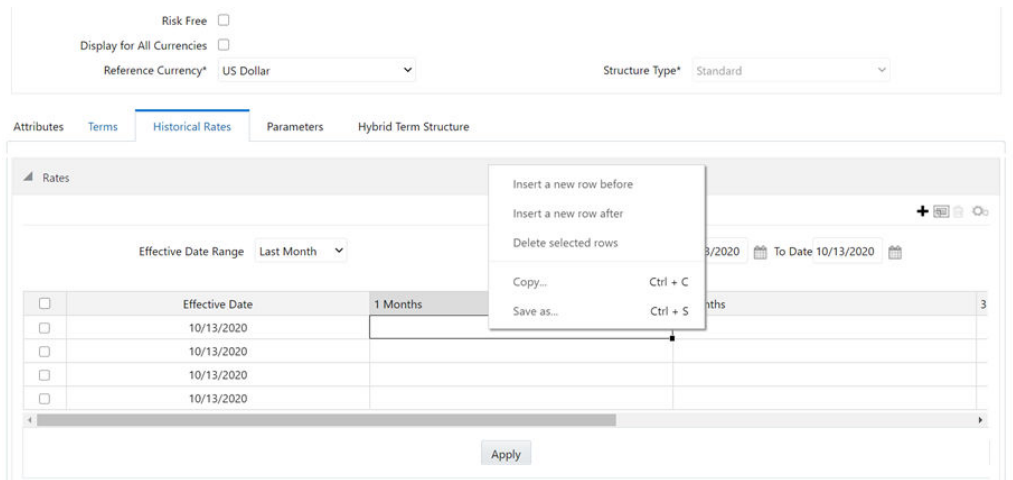
Click the **Data Loader** icon to execute all the currency rates.

5.4.8 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 5-12 Historical Rates Tab



5.5 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.

5.5.1 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.

5.5.2 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.

5.5.3 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.

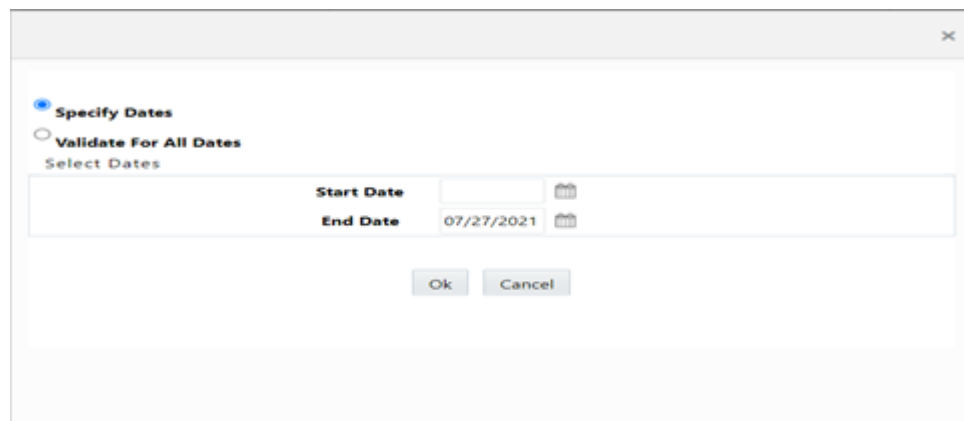
5.5.4 Running an Exchange Rate Validation

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.

5.5.4.1 Running a Validation Immediately

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

Figure 5-13 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:

1. Click **Common Object Maintenance**, select **Operations**, and then select **Simplified Batch**, and then click **Add**.
2. 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 **Rate_Validation** and click **Ok**.
3. 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.
4. Click **Save**.
5. In the **Simplified Batch Summary** page, search for and select your batch, then click **Run**.
6. 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.
7. 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:

Table 5-4 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_CONVE RT_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.

5.5.5 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.

5.5.6 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.

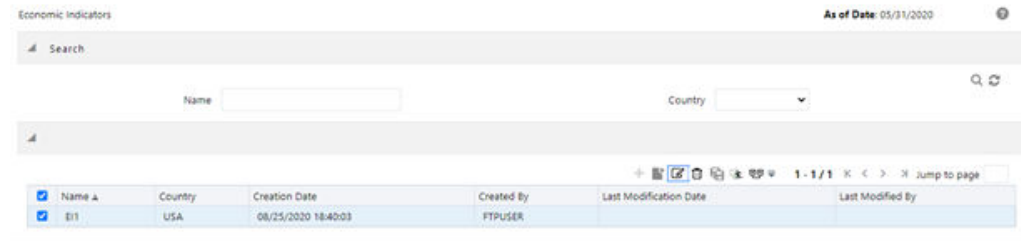
5.6 Economic Indicators Summary Page

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 5-14 Economic Indicators Summary page



5.6.1 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.

5.6.2 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.

5.6.3 Adding an Economic Indicator

To add an Economic Indicator, follow these steps:

1. Click **Add** from the Economic Indicator Summary page.
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 5-15 Economic Indicators - Historical Data section on Economic Indicator window

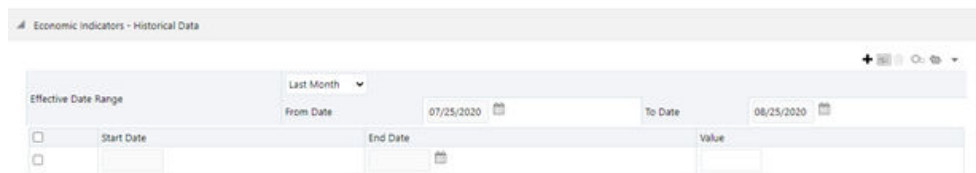


Table 5-5 Economic Indicators - Historical Data section - Fields and Descriptions

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.

Table 5-5 (Cont.) Economic Indicators - Historical Data section - Fields and Descriptions

Fields	Description
Viewing Economic Indicators - Historical Data	<p>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.</p> <p>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.</p>
Deleting Economic Indicators - Historical Data	<p>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.</p>
Data Loader	<p>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.</p> <p>To execute a data load, click the Data Loader. A warning message will appear Upload all available Economic Indicators?</p> <p>Click Data Loader to execute all the Economic Indicators.</p>
Excel Import and Export	<p>Use Excel Import or Export functionality to add or edit Historical Economic Indicators.</p>

6

Simplified Batches

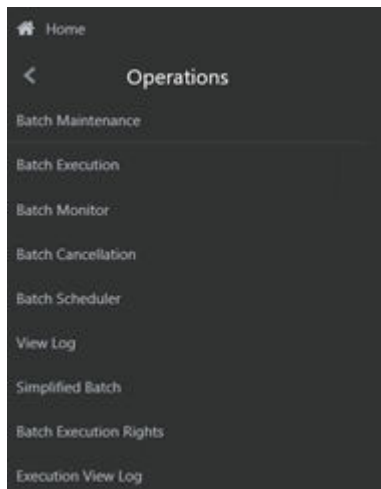
Simplified Batches provide a streamlined version of the functionality available in the broader standard Oracle Financial Services Analytical Applications (OFSAA) batch module.

The Simplified Batch feature is designed to facilitate the creation, maintenance, and execution of batches for the EPM application engines and various other OFSAA components. You can use its drag-and-drop approach to task selection especially helpful in the management of large batches.

6.1 Standard OFSAA Infrastructure Batching Functionality

You can view, execute, schedule, and monitor Simplified Batches within the OFSAA Operations batch framework. To view the Simplified Batch summary page, navigate to Common Object Maintenance, select Operations, and then select Simplified Batch.

Figure 6-1 Accessing the Simplified Batch Window



6.1.1 Batch Maintenance

The **Batch Maintenance** window is used to view the Simplified Batches, but you cannot edit them. Create and modify them within the **Simplified Batch** window.

Batch Execution

You can execute the Simplified Batches from the **Simplified Batch** summary page or the OFSAA Infrastructure UI by selecting **Operations**, and then **Batch Execution**.

Other Operations Batch Functionality

Other Operations batch functionality including Batch Scheduler, Batch Monitor, Batch Processing Report, Batch Cancellation, and View Log apply equally to Simplified Batches and to batches that have been built in the Batch Maintenance window.

For more information, see the [OFS Analytical Applications Infrastructure User Guide](#).

Topics:

- Simplified Batches
- Simplified Batch details
- Creating a Simplified Batch
- Running a Simplified Batch
- Viewing the Task Logs
- Additional Batch Options

6.1.1.1 Batch Execution

You can execute the Simplified Batches from the **Simplified Batch** summary page or the OFSAA Infrastructure UI by selecting **Operations**, and then **Batch Execution**.

6.1.1.2 Other Operations Batch Functionality

Other Operations batch functionality including Batch Scheduler, Batch Monitor, Batch Processing Report, Batch Cancellation, and View Log apply equally to Simplified Batches and to batches that have been built in the Batch Maintenance window.

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

This chapter describes the creation, maintenance, and execution of Simplified Batches.

Topics:

- Simplified Batches
- Simplified Batch details
- Creating a Simplified Batch
- Running a Simplified Batch
- Viewing the Task Logs
- Additional Batch Options

6.1.2 Simplified Batches

To view the **Simplified Batch** summary page, navigate to **Common Object Maintenance**, select **Operations**, and then select **Simplified Batch**. The Simplified Batch summary page displays a list of existing Simplified Batch rules. Using search criteria, you can control the set of batches that are displayed.

When you Add, Edit, or View a rule, a **Simplified Batch** details window is displayed.

The Simplified Batch summary page has a Search pane and a summary table. When you first navigate to the Simplified Batch summary page, the batches stored within your preferred folder are presented on the summary page. This preferred folder is determined by the set of Application Preferences that were last saved in which you selected the Active for Master Maintenance check box. For more information, see the [Application Preferences](#) section.

The summary table presents all the batches that meet the search criteria. The Simplified Batch summary page offers several icons that allow you to create a new batch or perform different functions when a batch is selected.

Click the column header (the column name) to sort on a column in the Simplified Batch summary page.

Figure 6-2 Simplified Batch Summary Page



6.1.2.1 Searching for a Simplified Batch

The Search page allows you to restrict the batches visible within the summary table by any combination of Name, Folder, or Status. Search by Name is a wild card character search, that is, searching for Name-like pricing will find all batches that include pricing within their names.

To search for a Simplified Batch Rule, follow these steps:

1. Enter the desired search criteria and click **Search**.
Click Reset to clear any search criteria and refresh the Simplified Batch summary page.
2. The search results are displayed in a tabular format containing all of the Simplified Batch Rule curves that meet the search criteria. The Simplified Batch Rules summary page offers several icons to perform the different functions when a Simplified Batch Rule is selected.
 - **Add:** Click the Add icon to begin the process of building a new Simplified Batch. 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. Click View to view the detailed definition of a Simplified Batch on a read-only basis. The View icon is only enabled when a single batch is selected.
 - **Edit:** Select a single row in the summary table to enable the Edit icon. Click Edit to modify an existing Simplified Batch. The Edit icon is only enabled when a single batch 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 Simplified Batch. The Copy icon is only enabled when a single Simplified Batch is selected. You can also duplicate a batch using the Save As from the Simplified Batch Detail page.
 - **Delete:** Select one or more rows in the summary table to enable the Delete icon. Click Delete to delete the batch or batches are selected.

- **Run:** Select a single row in the summary table to enable the Run icon. Click Run to execute the selected Simplified Batch rule. The Run icon is only enabled when a single Simplified Batch rule is selected. The As-of-Date and other parameters applicable to each task within a Simplified Batch will vary by task type. For more information, see the Specifying Task Parameters section in the OFS Analytical Applications Infrastructure User Guide.
 - **Refresh:** Click Refresh to refresh the Simplified Batch summary page, including updates to the Last Execution Date and Status.
3. To select a Simplified Batch Rule, select a check box in the first column of the table. More than one Simplified Batch Rules can be selected at a time, but this disables some of the action icons. You can select or deselect all the Simplified Batch Rules in the summary table 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 Simplified Batch Rule details based on the search criteria.

- **Name:** Displays the Simplified Batch rule's short name. Hover on a batch name displays the rule's system identifier, long name, and description.

 **Note:**

The rule's long name consists of a concatenation of the Information Domain (Infodom) and the rule's short name. This long name is the name under which the batch is submitted internally through the [Oracle Financial Services Analytical Applications \(OFSAA\) Infrastructure](#).

- **Creation Date:** Displays the Date and Time at which a Simplified Batch rule was created.
- **Created By:** Displays the name of the user who created a Simplified Batch rule.
- **Last Modification Date:** Displays the Date and Time at which a Simplified Batch rule was last modified.
- **Last Modified By:** Displays the name of the user who last modified a Simplified Batch rule.
- **Folder:** Displays the name of the Folder in which a Simplified Batch rule is stored.
- **Last Execution Date:** Displays the Date and Time at which a Simplified Batch was last executed.
- **Status:** Displays the latest status for a batch rule and includes the following possible values:

6.2 Simplified Batch Details

When you Add, Edit, or View a batch, the Simplified Batch details window is displayed. The Simplified Batch details window presents the following panes for defining and maintaining your batch:

- Simplified Batch - header level information, such as Rule Name, and so on
- Batch Execution Type
- Search Task Details
- Task Details
- Audit Trail

When you **Add**, **Edit**, or **View** a Simplified Batch Rule, the **Simplified Batch Rule** details window is displayed. The Simplified Batch Rule details window includes a Simplified Batch Rule details pane, three Simplified Batch Rule panes, and an **Audit Trail** pane.

The Audit Trail pane is a standard footer pane for every OFSAA rule type. It 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.

6.3 Creating a Simplified Batch

To create a Simplified Batch Rule, follow these steps:

1. Click Add from the Simplified Batch Rule summary page.

Figure 6-3 Simplified Batch details window to create a new Simplified Batch Rule

2. Enter the following information in the Simplified Batch Rule details window:

- **Name * and Description:** Simplified Batch Name and Description. You cannot edit the Name after you have created the rule.

The maximum length for the Name is based on (name and Infodom), subject to the total length not exceeding 42 characters. Underscore (`_`) is the only special character allowed for a Simplified Batch name.

The maximum length for the Description is 300 characters. Allowed special characters for a Simplified Batch description are underscore (`_`), hyphen (`-`), Colon (`:`), Dot (`.`), and Space.

- **Folder Name*:** Select a folder in which the batch is to be stored.
- **Access Type*:** Specify whether you want the batch rule to be Read, Write, or Read-Only.
* indicates Mandatory UI element.

3. Click **Save**. To build out your Simplified Batch Rule, enter the data within the Simplified Batch Rule details page. For more information, see the following sections:
 - Batch Execution Type
 - Searching Task Name
 - Task Details
 - Task Selection

6.3.1 Batch Execution Type

Select the tasks in the batch to run in Parallel or Sequentially. To run some tasks sequentially and some in parallel, utilize the OFSAA Infrastructure Operations batching framework to construct the batch. The Simplified Batching Framework provides a simpler and faster pathway to specify many of the batches that require, but the OFSAA Infrastructure Operations framework offers more flexibility.

Figure 6-4 Batch Execution Type on Simplified Batch details Window

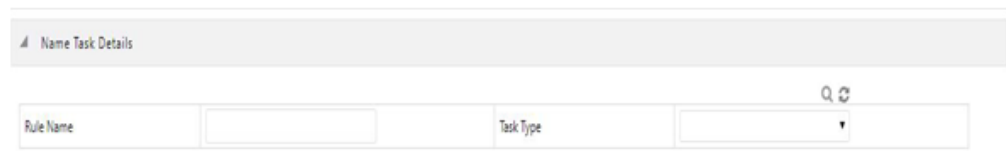


6.3.2 Searching Task Name

You can construct batches containing dozens or even hundreds of tasks. In such cases, it can become difficult to isolate a specific task.

The Search Task details pane allows you to focus on the Task Details and display a specific task name or task type. The Rule Name search is a wild card character search. Enter **Task Type**, **Folder**, or **Task Name**, and then click **Search**. Click **Refresh** to remove the search criteria and refresh the Task Details pane to display all tasks within the batch.

Figure 6-5 Searching for Task Details



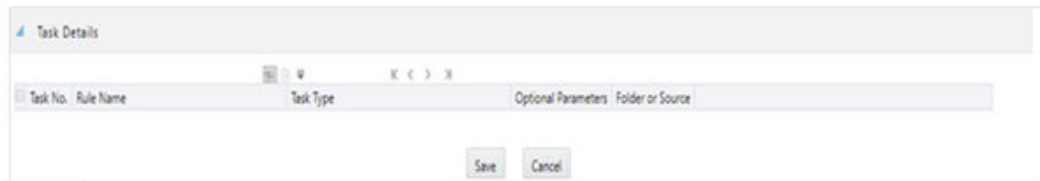
6.3.3 Task Details

For a new batch rule, the Task Details pane will initially be empty. Use the Task Selector to populate the Task Details pane with the processes to run in the batch. For a Sequential batch, the Task Details pane presents the tasks in the order in which they will be run. For a Parallel batch, all tasks are initiated in parallel.

The Task Details pane also provides a **Delete** icon for removing tasks from the batch.

- **Delete:** Selecting one or more rows in the Task Details page enables the Delete icon. Click Delete to remove the task or tasks that you have selected. You can also remove tasks through the Task Selection window.
- **Task Selector:** The Task Selector icon is always enabled. Click the Task Selector to open the Task Selection window.

Figure 6-6 Task Details pane of Simplified Batch details Window



This screen displays the following fields:

- **Task Number:** Each task is arranged sequentially by the task number.
- **Rule Name:** Displays the task's short name, such as an Allocation rule name. The complete or long name under which the task is submitted for execution (becoming the task's Batch Run ID) is a concatenation of several identifiers, as noted in the View Log. For more information, see the Viewing the Task Logs section.
- **Task Type:** Use Simplified Batches to submit the different tasks for each of the application engines and various other components. For ALM, the following task types can be submitted within a Simplified Batch:
 - ALM Dynamic Deterministic
 - ALM Dynamic Stochastic/Historical Simulation
 - ALM Static Deterministic
 - ALM Static Stochastic/Historical Simulation
 - Cash Flow Edits
 - Extract Data
 - RUN DQ RULE
 - SQL Rule
 - Transform Data

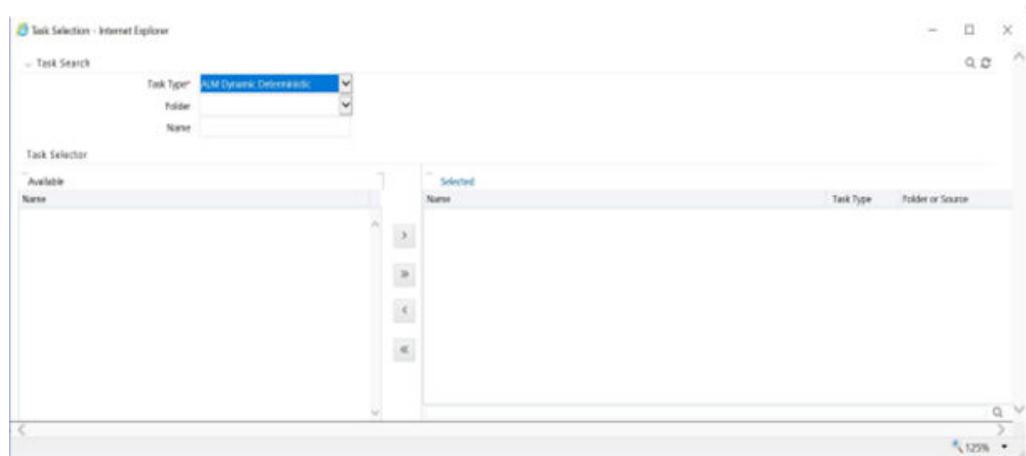
This list will vary based on the installed Application pack (or packs).

- **As of Dates and Additional Parameters:** The As of Date applicable to each task within a Simplified Batch will vary by task type. Some task types also accept runtime parameters. For more information about the task parameters, see the Specifying Task Parameters section in the OFS Analytical Applications Infrastructure User Guide.
- **Folder or Source:** For Extract Data tasks, values in this column represent Sources. For Transform Data tasks, this column is not applicable and is left blank. For all other task types, values in this column represent the Folder in which a rule is stored.

6.3.4 Task Selection

Click **Task Selector** from the **Task Details** pane to open the **Task Selector** window to support the maintenance of tasks in a batch.

Figure 6-7 Task Selection window



Use the **Task Selection** window to perform the following:

- Choose tasks to include in your batch
- Remove tasks from your batch
- Reorder tasks within your batch

To select the task from the **Task Selector** window, follow these steps:

1. After opening the **Task Selection** window, the list of **Available Tasks** on the left-hand side of the **Task Selector** window is blank.
2. To populate the list of available tasks, search the task in the **Task Search** pane. You must select a specific type of task from the Task Type drop-down list, and optionally specify search criteria for Folder (or Source) and Name, where applicable to the task type, and click Search.
3. Select the Task Type.
For ALM, the following are the available task types:
 - ALM Dynamic Deterministic
 - ALM Dynamic Stochastic/Historical Simulation
 - ALM Static Deterministic
 - ALM Static Stochastic/Historical Simulation
 - Cash Flow Edits
 - Extract Data
 - RUN DQ RULE
 - SQL Rule

- Transform Data

This list will vary based on the installed Application pack (or packs).

4. Select the **Source** or **Folder**.

- **Extract Data Task:** Select the Extract Data task to select a data source before executing your search.
- **Transform Data Task:** After selecting the Transform Data task, do not select a Folder before executing the search.
- **All Other Task Types:** Select any other Task Type to constrain the search to a particular folder. Alternatively, search for the tasks in all Folders by selecting blank (all folders).

Executing a search for tasks always refreshes the **Available** list of tasks, but never has any impact on tasks that you have already **Selected** (tasks on the right-hand side of the window).

You can further refine the search by entering a **Task Name**. Search using **Name** is wild card character searches, that is, searching for Name-like rate will find all tasks that include rate within their Name.

5. For Task Types with potentially large volumes of tasks, the **Available** list is divided into pages. Use the vertical scrollbar to navigate to the bottom of each page and click more to display the names on the next page. You can control the number of tasks listed per page by changing the setting in the `SIMPLE_BATCH_PAGE_SIZE` parameter in the `FusionApps.properties` file in the `WEB-INF/props` directory under context root. The recommended default value is 50 records per page. As you increase the value over a certain amount, you will start to see a slower response in the moving tasks between the Available and Selected lists.
6. Move the tasks between the Available and Selected lists. Use the **Select** or **Select All** buttons to move rules from the displayed page of the Available list to the Selected list or vice versa. The **Select ()** moves rules from the left to the right, adding rules from the Available list to the bottom of the Selected list. Moving rules from the right to the left remove rules from the Selected list. You can also use the drag-and-drop feature to place the rules in a specific position in the Selected list to specify the execution order for a Sequential Type batch.

Tasks within the **Available** list of tasks are disabled (greyed-out) after they are selected (that is, included in the **Selected** list of tasks).

The **Task Selector** also supports drag-and-drop operations for choosing Available tasks, removing Selected tasks, or rearranging the sequence of the Selected tasks.

- Select an **Available** task and then drag-and-drop it anywhere within the Selected list, where the targeted placement is displayed in the red line.
 - Dragging a task from the **Selected** list and dropping it into the **Available** list removes that task from the **Selected** list.
 - To select or deselect a range of tasks, click the first task in the range to be selected, press the Shift key, click the last task in the range to be selected, and then drag-and-drop the set of tasks.
 - To select or deselect a set of tasks that are not in sequence, click each task individually while pressing the Control key, after clicking on the last task to drag-and-drop the set of tasks.
7. Find a Selected task.

To search for any of the selected tasks, enter the Task Name or partial name in the field under the Selected list, and then click Search.

6.4 Running a Simplified Batch

To run a Simplified Batch from the Simplified Batch summary page, follow these steps:

1. Select a Simplified Batch from the **Simplified Batch** summary page.
2. Click **Run** to execute the batch.
3. A confirmation message is displayed. Click **Yes** to proceed, or **No** to return to the Simplified Batch summary page.
4. After clicking **Yes**, a **Date Selection** window is displayed. Select the appropriate date for use in processing. The Date defaults to the System Date. To change the Date, either directly enter a date in the format displayed, or use the **Calendar** tool. You can ignore the message *Please select a date if you have included Extract Data or Transform Data tasks in this batch.*
5. Click **OK**.
6. A confirmation message is displayed. Click **OK**.
7. You can monitor the status from the Simplified Batch summary page or the Simplified Batch details page.
 - a. To monitor the status from the Simplified Batch summary page, click **Refresh**. The summary page will update the Last Execution Date with the current date and the Status at completion (for example, Complete, or Failed if there was a critical problem).
 - b. To monitor the status from the Simplified Batch details page, see the [Viewing the Task Logs](#) section.



Note:

This currently applies to all task types except Extract Data and Transform Data.

6.5 Viewing the Task Logs

To view the processing log for each task in the batch, navigate to the log details from the Simplified Batch details page:

1. Select the batch from the **Simplified Batch** summary page.
2. Click **View** to navigate to the Simplified Batch details page.
3. For a specific task in the **Task Details** pane, navigate to the processing log through View Log.
4. In the **View Log** window, view the log details through the **Task ID** link. The Task ID represents the System ID of the task (for example, in Profitability Management, an Allocation Rule's System ID).

The task's Batch Run ID is a concatenation of several identifiers. For example, Batch Run ID **OELPMINFO_Task1_smb alloc2_20110805_2** represents the following:

- The information Domain name (for example, OELPMINFO)
- Task sequence within the Simplified Batch (for example, Task1)
- Simplified Batch rule name (for example, smb alloc2)
- The run date in YYYYMMDD format and the sequential run number for that date (for example, 20110805_2, for the second execution on August 5, 2011).

6.6 Additional Batch Options

You can also view, execute, schedule, monitor, cancel, and view task logs for Simplified Batches within the OFSAA Infrastructure Operations batching framework.

7

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 OFSAA Cash Flow Engine Reference Guide.

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.

Topics:

- [Searching for a Holiday Calendar](#)
- [Creating a Holiday Calendar](#)
- [Executing Holiday Calendar](#)
- [Holiday Exceptions](#)

7.1 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 7-1 Holiday Calendars

<input type="checkbox"/>	Name	Created By	Creation Date	Last Modified By	Last Modification Date	Status
<input type="checkbox"/>	Weekends	FTPUSER	06/17/2020 10:07:35	FTPUSER	06/17/2020 10:08:13	Processed

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:

1. 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.
2. 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.

7.2 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.

The Holiday Calendar functionality allows you to define two types of holidays: Fixed and Moving.

- 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. For a fixed holiday, the Holiday Calendar procedure will populate entries in the holiday list table for the selected date range.
- 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. Example: 10th April 2020 is a moving holiday for Good Friday.
- A HOLIDAY_TYPE code:
 - 0: Fixed type
 - 1: Moving type
 - 2: 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.

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 7-2 Holiday Calendar Definition

3. Enter a code value for the new Holiday Calendar.
The code is a numeric identifier for the Holiday Calendar. The code value must be a unique number between and must be between 1 and 99999.
4. Enter the name and a brief description for the Holiday Calendar.
The name you assign to the Holiday Calendar must be unique. The name can hold a maximum of 30 characters.
5. 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.
6. In the Holiday Details grid, define the Holiday details for any period within the holiday range defined in the previous step.

 **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).

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

7.3 Executing Holiday Calendar

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

Predefined rules are a prerequisite to execute the Holiday Calendar.

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.

7.4 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.

8

Oracle Asset Liability Management Process

This chapter describes the procedure to define and execute the end-to-end Asset Liability Management Process.

Oracle Asset Liability Management 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 (OFSA) are built. This description of the Oracle Asset Liability Management Process assumes that your system administrator has setup the OFSAAI data repository and has populated it with your enterprise-wide business data.

Topics

- [Overview of the Process](#)
- [Cleansing the Data by performing Cash Flow Edits](#)
- [Activating Currencies and Loading Exchange Rates](#)
- [\(Mandatory\) Deciding on historical rate information and managing by creating Interest Rate Codes](#)
- [Defining Economic Indicators](#)
- [Capturing Instrument Behavior for non-standard instruments](#)
- [\(Mandatory\) Defining Time Buckets](#)
- [\(Mandatory\) Defining Product Characteristics](#)
- [\(Mandatory - Deterministic\) Defining Forecast Rate Scenarios](#)
- [Transfer Pricing Methodologies and Rules](#)
- [Defining Transfer Pricing Methodologies Using Node Level Assumptions](#)
- [Defining Transaction Strategies](#)
- [Defining Formula Results](#)
- [\(Mandatory – Stochastic\) Defining Stochastic Rate Indexing Rules](#)
- [\(Mandatory\) Defining and Running the Asset Liability Management Process](#)
- [Accessing Asset Liability Management, Detail Cash Flow Results for Audit Purposes](#)
- [Accessing Asset Liability Management, Interest Rate Audit Results](#)
- [Re - processing Erroneous Accounts](#)
- [Consolidation of Results](#)

8.1 Overview of the Process

Oracle Financial Services Asset Liability Management (OFS ALM) is designed to model balance sheets under a variety of rate environments. OFS ALM functionality uses several key concepts and has evolved from the continual iterations of building simulated management processes. The basis of OFS ALM 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 and free-form timing bucket increments for reporting are critical to meet the wide range of forecasting requirements of financial institutions.
- An unconstrained chart of account definition is a basic requirement of effective modeling.
- A structured process for defining and controlling assumptions is critical to any successful modeling process.
- An unconstrained batching of scenarios, with flexible assumptions sets, is required to achieve an effective and efficient analytical process.

8.2 Key Operational Concepts

OFS ALM includes seven key modeling attributes:

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

8.2.1 Modeling Using Account-Level Data

OFS ALM 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.

8.2.2 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, prepayments, and discounting methodology are defined independently. This facilitates the isolation of the impact of a change on one assumption. You simply modify the selected assumption and reprocess in a separate processing run.

8.2.3 Flexible Reporting Buckets

Because the assumptions are separate from the data, and because the model is operating on an account level of detail, you can specify assumptions and reporting time buckets in any increment desired. Since each transaction's cash flows are being solved independently, you can mix and match any combination of time buckets (up to 240). Changing the bucket structure will not impact the calculations. Thus, you might

model, and report results on a daily and weekly basis for liquidity analysis while employing a monthly five-year forecast for ALM Management. In either case, the results produced are consistent.

8.2.4 Structured Approach to Defining Rate Scenarios

Structured testing of alternative rate environments is 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 are 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 must 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.

8.2.5 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.

8.2.6 The Power of Assumption Rules

You can mix and match any set of combinations of assumptions: Forecast Rate Scenarios, Forecast Balances, Pricing Margins, Maturity Mix Strategies, Discounting Methods, Prepayments, Transaction Strategies, Formula-based Results, and Product Characteristics. 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. By defining assumptions as distinct rule sets, unlimited batching of scenarios is possible.

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 by assumptions.
- 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.
- Incremental transaction strategies can be used.
- Cash flows are determined through the integration of data and assumptions.
- Assumptions can be flexibly batched.

Current Position Data

OFS ALM forecasts 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. Accounts are also defined to simulate non-interest income and expense.

New Business Volumes

New Add volumes in each period are defined based on a forecast of new incremental volume for each account or calculated based on 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.

The Maturity Mix of New Volumes

The maturity mix of forecasted volumes originated for an account is determined by assumptionsthat are applied to each element of the account.

Pricing of New Volumes andRepricing

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.

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 instrument characteristics to driveprepayment behavior.

Incremental Transaction Strategies

Incremental transaction strategies can be defined which create actual originations or sales of assets and liabilities, or Off-Balance sheet transactions.

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.

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-leveldata)
- Forecast Rate Scenario Assumptions
- Forecast Balance Assumptions
- Maturity MixStrategies
- Pricing MarginAssumptions
- PrepaymentAssumptions

- TransactionStrategies
- Discount Method Assumptions (for market value calculations)
- Product Characteristics Assumptions
- Formula Result Assumptions

The Flow of the Modeling Process

The organization of the OFS ALM 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.
4. 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 ALM Processing and is a critical step in ensuring that OFS ALM produces expected results.
5. Define modeling assumptions.
6. 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.
7. Specify the model run.
8. Select a combination of assumption sets which 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.

8.3 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 Asset Liability Management 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 ALM processing.

8.4 Cleansing the Data by performing Cash Flow Edits

It is important that the data in the Instrument tables is clean, accurate, and complete before it is used to generate cash flows and for further processing. Oracle ALM 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. Also, you can view the 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.

8.5 Setting Application Preferences

The Application Preferences allow users to set the current As Of Date and configure default values used throughout the application.

8.6 Activating Currencies and Loading Exchange Rates

Rate Management under **Common Object Maintenance** menu 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 currencies. After 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 required. Also, you can designate key currencies to be used for reporting. These alone will be available for cross-currency consolidation.

The **Currencies** window enables you to select currencies for reporting and for establishing interest rates and exchange rates. It allows you to activate relevant currencies and classify as:

- FunctionalCurrency
- ReportingCurrencies
- Other ActiveCurrencies

Before defining the classifications, let us understand the two types of currencies: ISO-defined and User-defined.

8.6.1 Currency Definitions and Classifications

OFSAA Rate Management provides a list of ISO-defined currencies for you to activate as required. (The functional currency is activated upon installation). You can also define and add your currencies. Any currency except the functional currency can be deactivated or deleted.

Currencies are displayed in alphabetical order by currency code.

8.6.2 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.

8.6.3 Reporting Currencies

A reporting currency is an active currency that balances when the other currencies are 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.

8.6.4 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 the Oracle Financial Services Analytical Applications Data Model Utilities User Guide.

For more information on loading exchange rate data using the Currency Rates, see the Currency Rates section.

8.7 (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 or 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. For more information, see the Interest Rates Details section.

For more information on loading interest rate data using the staging area and the related data loader utility, see the Oracle Financial Services Analytical Applications Data Model Utilities User Guide.

8.8 Defining Economic Indicators

You can define, input, and maintain economic indicator data within Rate Management. Economic Indicator data is used in ALM within Rate Dependency Patterns allowing users to associate their forecast assumptions with changes in specific Economic Indicators. Economic Indicator data is also available within the ALM Business Intelligence application for viewing related trends and spreads.

For more information on loading Economic Indicator data using the staging area and the related data loader utility, see the Oracle Financial Services Analytical Applications Data Model Utilities User Guide.

For more information on loading interest rate data using the Economic Indicator user interface, see the Economic Indicators Summary Page section.

8.9 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 Asset Liability Management allows you to define custom behavior, payment, and repricing patterns to accurately model the unique characteristics for such instruments.

8.9.1 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

After 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 preset range (70000 – 99999). When the cash flow engine encounters an instrument with an amortization type code within this predetermined range, it understands that a Behavior Pattern should be referenced for determining the principal cash flow amounts.

8.9.1.1 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 must 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 must be after As of Date of the process run. Write-off events 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.

Non-Maturity

Behavior Sub Type = Core and Volatile (from Behavior Pattern).

Instrument records need not contain behavior subtype. The engine will generate the core Run-offs and volatile Run-offs based on the pattern definition. Interest cash flow is paid out on the payment dates.

Original Term, Amortization Term, Maturity Date: The 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.

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 subtype code is used by the engine to generate the devolvement or recovery events.

- If subtype =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 must 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 must 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.

8.9.1.2 Behavior Pattern Structure

Oracle Asset Liability Management 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 8-1 Payment type of Pattern Type

Pattern Type	Payment Type
Non-Maturity	Volatile
	Core
	Sub Standard
Non-Performing	Doubtful
	Loss
	Sight Devolvement
Devolvement and Recovery	Sight Recovery
	Usance Devolvement
	Usance Recovery

8.9.1.3 Payment Events

You must define one or more payment event 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

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.

Table 8-2 List of supported 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 the principal for a level principal payment type. For both types of patterns, absolute value payment amounts are entered as gross of participation.
Interest Only	This is a calculated payment amount. An interest-only payment is calculated during processing as balance times rate times accrual factor.

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.

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 for this type of payment pattern.

8.9.1.4 Principal Runoff Term

The Term of the principal Run-off 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 Run-off term for the first amount as "1 Day". In this case, Tenor = 1 and Multiplier = Day.

8.9.1.5 Amount

The cash flow amount is defined as a percentage of the end of the period balance. For example, in the case of Non-Maturity behavior pattern type, if the assumption for the Volatile Run-off 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 at the bottom of the Pattern detail area indicating the cumulative percentage.

8.9.1.6 Payment Type

The payment type selection categorizes all payment Run-off into meaningful groupings. The principal Run-off 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 Write-off Positive
- 187 Timing of Write-offPositive
- 188 Write-offNegative
- 189 Timing of Write-offNegative
- 200 Non-Maturity - CoreRunoff
- 201 Timing of Non-Maturity - CoreRunoff
- 202 Non-Maturity - VolatileRunoff
- 203 Timing of Non-Maturity - VolatileRunoff
- 204 DevolvementRunoff
- 205 Timing of DevolvementRunoff
- 206 RecoveryRunoff
- 207 Timing of RecoveryRunoff

- 208 Non-Performing AssetRunoff
- 209 Timing of Non-Performing AssetRunoff

8.9.2 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 paymentfrequency
- Seasonal paymentdates
- Nonstandard or variable paymentamounts

After you create a payment pattern, you can use it by entering the payment pattern code as the amortization type code for the instrument.

8.9.2.1 Payment Pattern Structure

Oracle Asset Liability Management 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 of time.

You can also define a payment pattern with both absolute and relative payment events. This type of pattern is called a split pattern.

Also, for each payment pattern, you must 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.

8.9.2.2 Payment Events

You must define one or more payment event 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

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.

Table 8-3 List of supported 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 the principal for a level principal payment type. For both types of patterns, absolute value payment amounts are entered as gross of participation.
Interest Only	This is a calculated payment amount. An interest-only payment is calculated during processing as balance times rate times accrual factor.

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.

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 interest only for this type of payment pattern.

8.9.2.3 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 have decreased again to 50% of the original payment.

You can define absolute payment patterns only up to a year. This is because all entries are automatically ordered by date and are scheduled in a single year rotation.

8.9.2.4 Relative Payment Patterns

Relative payment patterns are 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.

8.9.2.5 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.

8.9.3 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 RepricingPattern
- User-defined RepricingEvent

Oracle Asset Liability Management Repricing Pattern interface supports simultaneous multi-user access.

8.9.3.1 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. Two types of repricing patterns that you can define are:

- Absolute Repricing Pattern
- Relative Repricing Pattern

8.9.3.2 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.

This initial event is required for the setup of all repricing patterns but is not used in OFS FTP. This feature is used only by Oracle ALM 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.

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. Event Detail You define each event with a repricing type of either flat rate or indexed rate. The repricing types determine the event detail characteristics that are 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.

Table 8-4 Event Detail Characteristics: Flat Rate

Characteristic	Description
Net Rate	The new net rate value
Gross Rate	The new gross rate value
Transfer Rate	The new transfer rate value

The flat rate always overrides the caps and floors defined on the instrument record.

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:

Table 8-5 Event Detail Characteristics: Indexed Rate

Characteristic	Description
Interest Rate Code	The reference interest rate 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 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 the 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.

8.9.3.3 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 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.

8.9.3.4 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.

8.9.3.5 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 mixed 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 $[(\$50,000 \times 0.00\%) + (\$50,000 \times 2.50\%)] / \$100,000 = 1.25\%$
Scenario 2, the instrument table contains 1 aggregated instrument record:

Account #1 = \$100,000

In scenario 2, the mix percentage is needed.

The resulting rate will be $(0.00 \times .50) + (2.50 \times .50) = 1.25\%$

8.9.4 Loading Payment Schedule Details

Supporting instrument records that have unique payment characteristics is the Payment Schedule option. You 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 the *Initializing Schedule Records* and *Amortization Type Code* sections of the Oracle Financial Services Cash Flow Engine Reference Guide.

8.10 (Mandatory) Defining Time Buckets

Time buckets allow you to specify the time periods used for storing and reporting results. Within the Time Bucket rule, Income Simulation Buckets (also known as Modeling Buckets) set the modeling horizon for date-related business rules. When you change the number or frequency of the modeling buckets, existing rules are affected, so use caution before changing your active time bucket rule.

Forecast Rules that have time bucket dependencies do not adjust dynamically if you change the modeling buckets in your Time Bucket Rule.

Within a Time Bucket rule, you can specify any combination of days, months, and years when setting up the buckets. Although all Oracle ALM cash flows are generated daily, they are aggregated into defined modeling buckets when results are stored. ALM BI Reports access information from the modeling buckets and let you aggregate buckets. For example, you can define monthly modeling buckets but generate a quarterly income statement. On the other hand, you cannot generate a weekly balance sheet if all modeling buckets are monthly.

If you want to use different configurations of modeling buckets, such as all monthly or all quarterly, you should create a separate Time Bucket rule for each and use a naming convention to identify the distinctions. All date-related assumption rules should be defined and used in the context of a single set of modeling buckets or a single Time Bucket rule.

Defining Time Buckets is a mandatory step in setting up and configuring the Oracle ALM application. Defining Dynamic Start Dates

In addition to defining Income Simulation Buckets, Time Bucket rules also allow you to define separate bucket assumptions for Interest Rate GAP and Liquidity GAP results in a single rule. This capability allows you to minimize the number of Time Bucket rules required to support all of your calculations.

You can also define future start dates (also known as Dynamic Start Dates) within either of the Interest Rate or Liquidity GAP bucket windows.

The following example illustrates how to define additional Dynamic Interest Rate GAP and (or) Liquidity GAP buckets within Time Bucket Rules.

The **Time Bucket** window shows the setup of an additional **Dynamic Start Date** set to begin at **As_of_date + 3 days**. If the forecast contains new business assumptions that occur between the As of Date and Dynamic Start Date 2, then they will be included in the output.

8.11 (Mandatory) Defining Product Characteristics

Product Characteristic rules allow you to define payment, pricing, and repricing characteristics for new business. They are also used to specify general calculation attributes for both existing accounts and new business.

Defining a Product Characteristics rule is a mandatory step in setting up and configuring the Oracle ALM Application.

8.12 (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, repricing existing business, calculating prepayments, determining discount methods, and in determining rate-dependent forecast assumptions. The ALM process uses currency exchange rate forecasts to account for the effects of currency fluctuations on income.

The Forecast Rates Scenario rules use Interest Rate Codes, Currency Codes, and Economic Indicator Codes defined or stored in Rate Management, including all the active 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 ALM Application.

8.13 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 the Defining Prepayments section.

8.13.1 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 Prepaymentmethod
- Prepayment Modelmethod
- PSAMethod
- Arctangentmethod
- ADCo Prepaymentmethod

For more information on ADCo Prepayment method, see the Andrew Davidson and Company (ADCo) Prepayment Method.

8.13.2 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.

Constant Prepayment method of **User-defined Prepayment Tenors** allows prepayment on any date, irrespective of contractual payment dates. You can create your origination date ranges and define

prepayment tenor (or tenors) for each range. You can associate a specific prepayment rate for each prepayment tenor.

8.14 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.

All prepayment rates should be input as annual amounts.

Prepayment Model Structure

A typical Prepayment model structure includes the following:

- **Prepayment Drivers:** You can build a Prepayment model using one to three prepaymentdrivers. 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 ofthe 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 definedprepayment driver nodes.

Types of Prepayment Drivers

The Prepayment Drivers are designed to allow the calculation of prepayment rates at runtime 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.

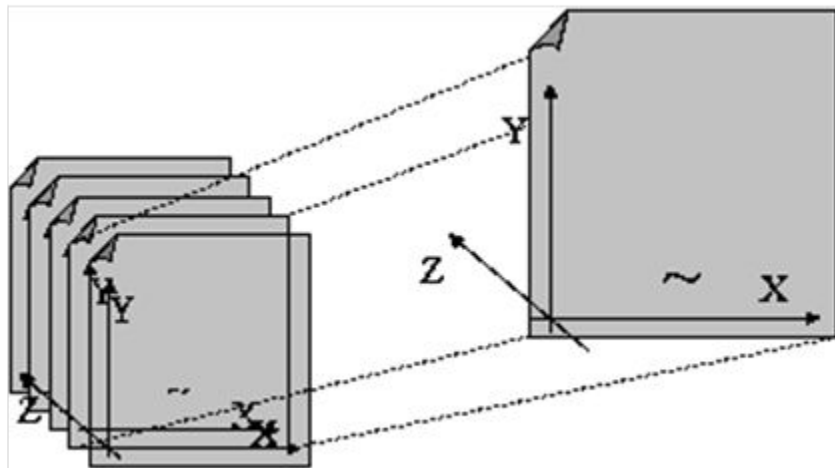
Prepayment drivers can be divided into the following two categories:

- **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. Thesedrivers 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 120months.
 - **Repricing Frequency:** You can vary your prepayment assumptions based on the repricing nature of the instrument being analyzed. Again, you could specify different prepaymentspeeds for different repricing frequencies and the system would decide which one to apply at runtime 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 experiencefaster 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 Run-off. 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.

Figure 8-1 Three-driver 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 Asset Liability Management allows you to build prepayment models using the Prepayment Model rule. The Prepayment Model rule can then be referenced by a Prepayment Rule. See the Prepayment Models section.

8.14.1 PSAMethod

The PSA Prepayment method (Public Securities Association Standard Prepayment Model) is a standardized prepayment model that is built on a single dimension, expired term. The PSA curve is a schedule of prepayments which 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 origination date ranges and assign a particular PSA speed to all the instruments with origination dates within a particular origination date range.

PSA speed inputs can be between 0 and 1667.

8.14.2 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).

All prepayment rates should be input as annual amounts.

user-defined coefficients adjust this function to generate differently shaped curves. Specifically: $CPR_t = k_1 - (k_2 * ATAN(k_3 * (-C_t/M_t + k_4)))$

where CPR_t = annual prepayment rate in period t C_t = coupon in period t

M_t = market rate in period t

$k_1 - k_4$ = user-defined coefficients

A graphical example of the Arctangent prepayment function is shown , using the following coefficients:

$k_1 = 0.3$

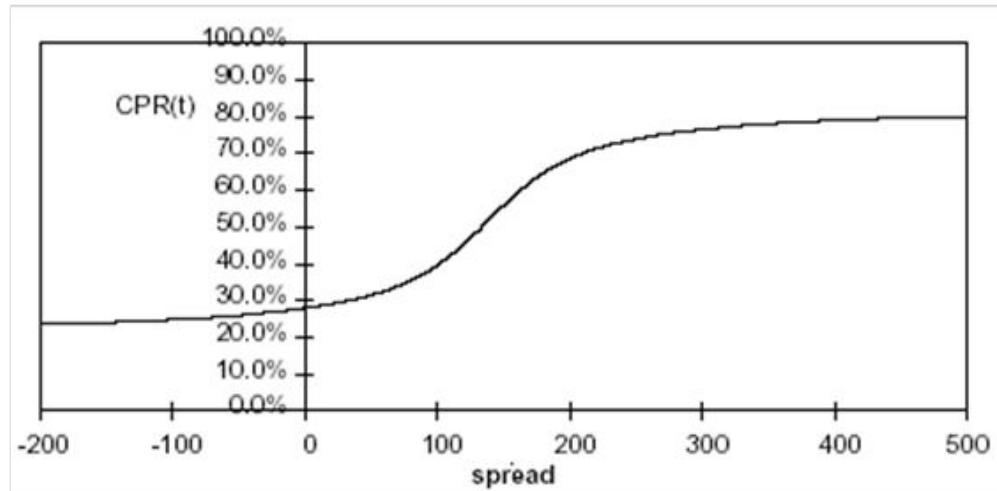
$k_2 = 0.2$

$k_3 = 10.0$

$k_4 = 1.2$

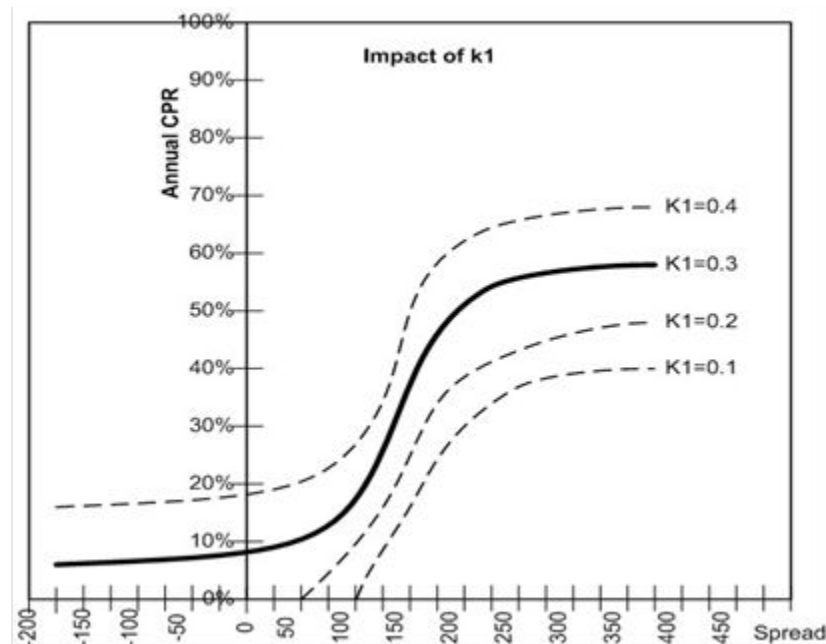
Each coefficient affects the prepayment curve differently.

Figure 8-2 A graphical example of the Arctangent Prepayment function using the coefficients



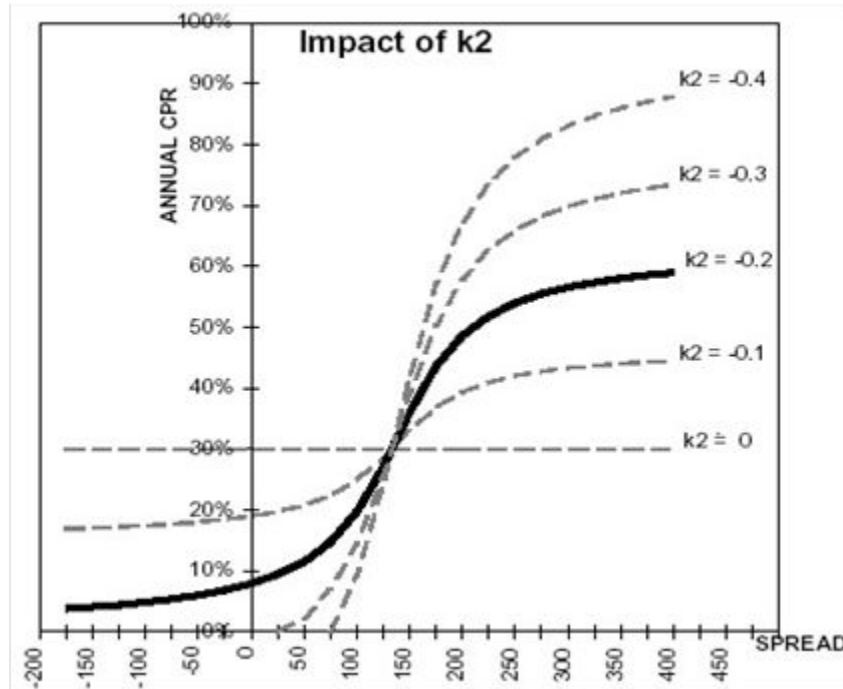
The following diagram shows the impact of K1 on the prepayment curve. K1 defines the midpoint of the prepayment curve, affecting the absolute level of prepayments. Adjusting the value creates a parallel shift of the curve up or down.

Figure 8-3 Impact of K1 on the Prepayment Curve



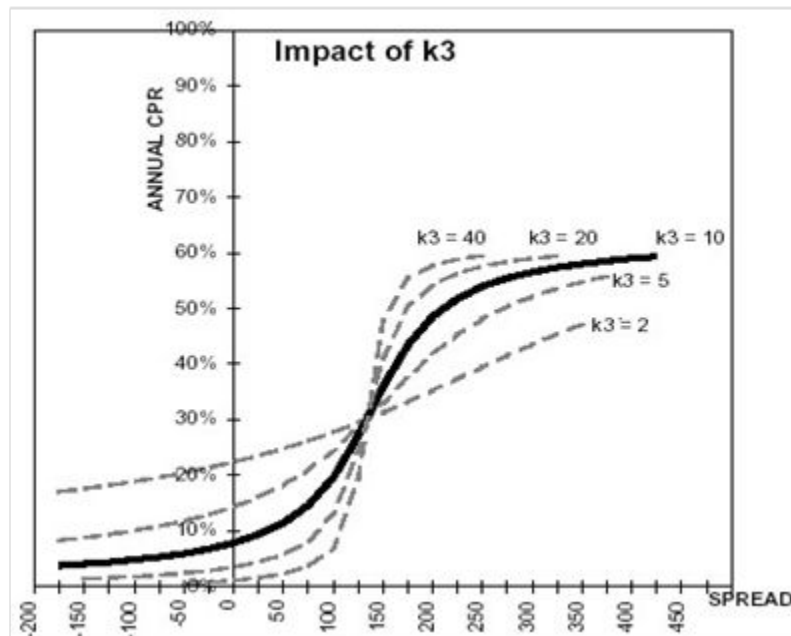
The following diagram shows the impact of K2 on the prepayment curve. K2 impacts the slope of the curve, defining the change in prepayments given a change in market rates. A larger value implies greater overall customer reaction to changes in market rates.

Figure 8-4 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.

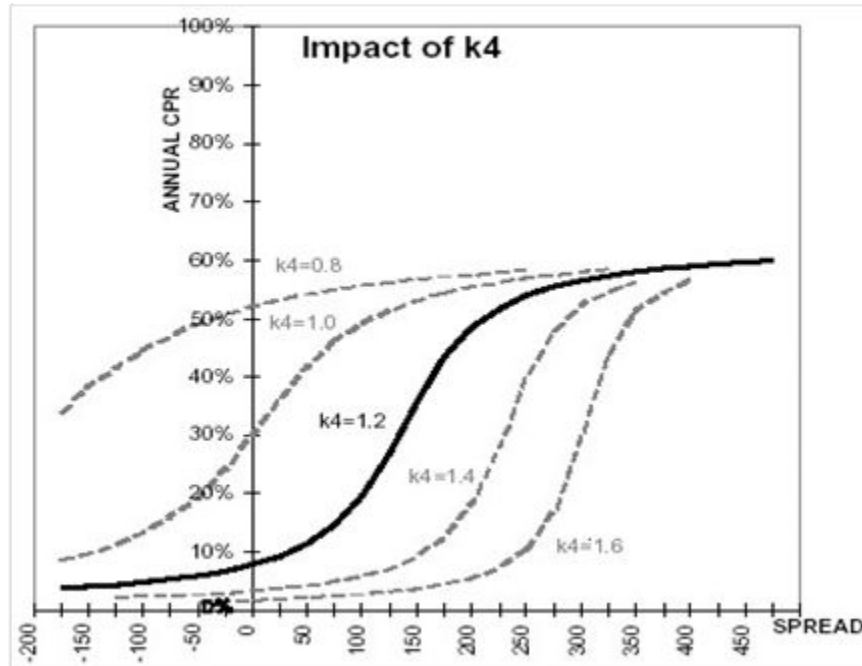
Figure 8-5 Impact of K3 on the Prepayment Curve



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 8-6 Impact of K4 on the Prepayment Curve



8.15 Defining Discounting Methods

Discount Method rules allow you to define based on your product hierarchy, the method for discounting projected cash flows for market value purposes. For each product and currency, you can choose one of the following discount methods and the corresponding reference rates (IRC) for discounting:

- Spot Input
- Spot Interest Rate Code
- Forecast (OriginalTerm)
- Forecast (RemainingTerm)

8.16 Defining Forecast Assumptions

You can define new business assumptions in Oracle ALM through three different assumption rules, which work together to define the volume, term, and pricing level:

- Forecast Balances
- Forecast Maturity Mix

- Forecast Pricing Margins

Forecast Balance rules allow you to input the new volumes that you expect to originate over the forecast horizon. The horizon over which you input Forecast Balance assumptions is determined by the Income Simulation buckets defined in your **Active** Time Bucket rule.

In addition to the volumes of new business defined in your Forecast Balance assumption rule, you must also define the corresponding Maturity Mix and Pricing Margins associated with the new volumes. These assumptions are managed through the Forecast Maturity Mix and Forecast Pricing Margin assumption rules.

8.17 Defining Transfer Pricing Rules

Defining Transfer Pricing rules is one of the optional steps in the Oracle Asset Liability Management 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.

For more information, see the Defining Transfer Pricing Methodologies Using Node Level Assumptions section.

To reduce the amount of effort required to define the transfer pricing methodologies for various products and currencies, OFS FTP allows you to define transfer pricing methodologies using node level and conditional assumptions.

Node Level Assumptions

Oracle Asset Liability Management 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 ALM assumption rules.

You can define transfer pricing, prepayment, adjustment rule methodologies, and other ALM 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 explicitly defined for a child take precedence over those at the parent level. For more information, see the Defining Transfer Pricing Methodologies Using Node Level Assumptions section.

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 assigns 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 ALM assumption rules to the fixed-rate loans and another to the floating-rate loans.

8.18 Transfer Pricing Methodologies and Rules

The transfer pricing methodologies supported by Oracle Asset Liability Management 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 point in time and does not have the required financial details to generate cash flows, thus preventing you from applying cash flow methodologies to this data.

The cash flow methods are also unique where Prepayment rules are used only with these methods. You can select the required Prepayment rule when defining an ALM Process.

Oracle Asset Liability Management supports the following cash flow Transfer Pricing methods:
 - Cash Flow: AverageLife
 - Cash Flow:Duration
 - Cash Flow: Weighted Term
 - Cash Flow: Zero DiscountFactors
- **Non cash Flow Transfer Pricing Methods:** These methods do not require the calculation of cash flows. Oracle Asset Liability Management supports the following non-cash flow transfer pricing methods:
 - MovingAverages
 - Straight Term
 - Spread from Interest RateCode
 - Spread from NoteRate
 - RedemptionCurve

8.18.1 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 that 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.

8.18.2 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 must assign the Lag Term to specify a length of time prior to 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.

8.18.3 Spread from Note Rate

To generate transfer prices using this method, you must 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 appropriately 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 must enter a negative rate spread.

Table 8-6 Example of Rate Spread

Account Type	Matched Spread	Sign of Rate Spread
Asset	Positive (Profitable)	Negative
Asset	Negative (Unprofitable)	Positive
Liability or Equity	Positive (Profitable)	Positive
Liability or Equity	Negative (Unprofitable)	Negative

8.18.4 Cash Flow: Average Life

The Average Life method determines the average life of the instrument by calculating the effective term required to repay back 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.

Oracle Asset Liability Management 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.

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 refer to the average life as a reference term within an Adjustment Rule

8.18.5 Cash Flow: Duration

The Duration method uses the Macaulay Duration formula.

Figure 8-7 Macaulay 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.

CF_n = 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.

t_n = Remaining term to cash flow n, expressed in years.

Oracle Asset Liability Management 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 can directly input when 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.

You 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. 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 refer to the duration as a reference term within an Adjustment Rule.

8.18.6 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, the origination date, and the maturity date for fixed-rate instruments.

- Standard CalculationMode:
 - For fixed-rate Products (Repricing Frequency = 0), use Yield Curve Date = OriginationDate, 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 the tease period, use Last Repricing Date and Repricing Frequency.
- Remaining Term CalculationMode:
 - 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
theaccount

8.18.7 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 time period, n , with the present value of the cash flow (discounted by the rate on the instrument) in that period.

Since the goal of the Weighted Term method is to calculate a weighted average transfer rate, it weights the transfer rate in each period, y_n , 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 or expense. The total transfer pricing interest income or 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 **Discounted Cash Flow** option selected, can be summarized by the following formula:

Figure 8-8 Weighted Term method

$$\text{Weighted-Average} = \bar{y} = \frac{\sum_{n=1}^N \left[y_n \times \frac{CF_n}{(1+r)^m} \times t_n \right]}{\sum_{n=1}^N \left[\frac{CF_n}{(1+r)^m} \times t_n \right]}$$

In this formula:

N = Total number of payments from Start Date until the earlier of repricing or maturity.
CF_n = Cash flow (such as regular principal, prepayments, and interest) in period n.

r = Periodic coupon rate on instrument (current rate or payments per year). m =
Remaining term to cash flow n or active payment frequency.

t_n = Remaining term to cash flow n, expressed in years. y_n = 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.

8.18.8 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 (and 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. 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.

Zero Discount Factors = y =

Figure 8-9 Zero Discount Factors

$$100 \times \left[\frac{B_0 - \sum_{n=1}^N (B_{n-1} \times DTP_n) + \sum_{n=1}^N (B_n \times DTP_n)}{\sum_{n=1}^N (B_{n-1} \times DTP_n)} \right] \times P$$

In this formula:

B_0 = Beginning balance at the time, 0.

B_{n-1} = Ending balance in the previous period.

B_n = Ending balance in the current period.

DTP_n = 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:

This table shows how to derive zero-coupon discount factors from monthly pay Transfer Pricing Rates.

Table 8-7 Example on how to derive zero-coupon discount factors from monthly pay Transfer Pricing Rates

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

8.18.9 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 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 shows the difference between the Yield Curve and Historical Terms.

Table 8-8 An Example of Yield and Historical Terms

Moving Average	Yield Curve Term
Six-month moving average of 1-year rate	1 year (or 12 months)
Three-month moving average of the 6-month rate	6 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 Asset Liability Management 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.

8.19 Defining Transfer Pricing Methodologies Using Node Level Assumptions

In Oracle Asset Liability Management, your product portfolio is represented using the Product Dimension specified in your ALM Application Preferences. Node Level Assumptions allow you to define transfer pricing, prepayment, adjustment, and other ALM 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 ALM 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 can assign assumptions at different levels throughout the hierarchy.

If you want to transfer price the product hierarchy using the Spread from Interest Rate Code, then Transfer Pricing method accepts for the following products:

- Mortgages: Transfer price them using the Zero Discount Factors cash flow-based method.
- Credit Cards: Transfer price all but secured credit cards using the Spread from NoteRate 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 CashFlow
- Credit Cards: Spread from NoteRate
- Secured Credit Cards: Spread from Interest RateCode

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. The Spread from IRC is specified at the leaf level, the system need not 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.

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 or 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.

8.20 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. Also, Adjustments allow you to apply event-based logic using conditional assumptions that are applied or varied only if a specific condition is satisfied.

8.20.1 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
- FixedAmount
- Formula BasedRate
- 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:

- EconomicLoss
- FixedAmount
- FixedPercentage

For more information on Breakage Charge, see the Oracle Financial Services Funds Transfer Pricing User Guide

8.20.1.1 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 reference term ranges and assign a adjustment amount to all instruments with a reference term falling within the specified range. All Adjustment Rates should be input as annual rates.

8.20.1.2 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_LIFEcolumn.

You can create your 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 (that is, Curve A – Curve B).

Assignment Date selections include:

- As ofDate
- Last RepricingDate
- OriginationDate
- TP Effective Date
- Adjustment Effective Date
- Commitment StartDate

The formula definition includes the following components:

Term Point: Allows you to associate a specific term point from the IRC to each Term Range.

Coefficient: Allows you to define a multiplier that is applied to the selected rate.

Rate Spread: 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

For increased precision, you can reduce the Term Ranges to smaller term increments allowing you to associate specific IRC rate tenors with specific terms.

8.20.1.3 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 (or Rates). Outputs will be written to the respective Adjustment Rate column, that is, Basis Risk Cost Rate, Liquidity Premium Rate, Pricing Incentive Rate, or Other Adjustment Rate.

8.20.1.4 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 thereprice 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 originalterm 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 is 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 reference term ranges and assign an adjustment amount to all instruments with a reference term falling within the specified range.

All adjustment amounts should be input in base currency for the selected product/ or currency combination.

8.21 Defining Transaction Strategies

With Transaction Strategies, you can test the impact of various hedging strategies that are integrated with basic scenario modeling assumptions. This supports you in testing alternative strategies and their incremental impact on results. The testing is facilitated by the separation of Transaction Strategies from basic scenario assumptions. You can also use this business rule to add specific instrument records to a processing run without changing the actual instrument data.

A transaction can be either positive or negative and can be defined for any product leaf member. A Transaction Strategy assumption rule can contain any number of individual transactions.

8.22 Defining Formula Results

With Formula Results, you can model deterministic results for a specific product leaf using the results of the cash flow, gap, and market value processes to recalculate and change system-generated data.

You can also use this capability to model results for a product leaf outside of the cash flow engine, using formulas to create outputs.

For example, you can model the ending balance of a particular account as 110% of the ending balance of a second account. You can also calculate non-interest income and expense amounts as percentages of new volumes. These relationships are defined in Formula Results.

There are four formula types:

- Cashflow
- RepricingGap
- LiquidityGap
- MarketValue

8.23 (Mandatory – Stochastic) Defining Stochastic Rate Indexing Rules

The Stochastic Rate Indexing rule is a required assumption rule, that you select within a Stochastic ALM Process to calculate Value at Risk and Earnings at Risk.

The purpose of the Stochastic Rate Indexing Rule is to establish relationships between a risk-free Interest Rate Code (IRCs) and other interest rate codes or Indexes used for repricing existing business and pricing new business. The Stochastic Rate Indexing rule allows you to select the valuation curve that the system uses during stochastic processing. Within a Rate Index rule, you can define the relation of the valuation curve to the index curve for multiple currencies.

Stochastic Monte Carlo or Historical simulation is a single factor modeling of interest rates of Reporting Currency. Although the engine does convert Balances into Reporting Currency, there is no correlation of Risk factors of Currency's Interest rates with Reporting Currency. Stochastic processing is not intended for Multi-currency processes. For best results, run Historical or Monte Carlo calculation for a single currency where Functional Currency = Reporting Currency.

During Stochastic ALM processing, the system generates future interest rates for the valuation curve you selected, which are then used to derive the future interest rates for any Index associated with that valuation curve based on the relationship you define. The rates thus forecasted for the IRCs or Indexes depend on the risk-free curve used for the valuation of instruments associated with the derived IRCs or Indexes. As the risk-free rates change, the non risk-free interest rates change accordingly.

8.24 (Mandatory) Defining and Running the Asset Liability Management Process

When all of the assumptions for a forecast are defined, users can define and execute ALM Processes where they combine the relevant assumptions into an ALM simulation run. ALM Processes initialize all selected assumption data and call the cash flow engine to execute the selected calculation processes and generate a result set. An ALM Process requires specific inputs based on the ALM Process type, including:

- Product Hierarchy or 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. Results from each process run are optionally stored in the ALM BI schema and become available for ALM reporting.

8.25 Reviewing Processing Errors

There is always the possibility that errors may occur during the execution of an ALM Process. A log of such errors is generated during processing and can be accessed by selecting the **View Log** from both the ALM Standard and Stochastic 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 ALM 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.

8.26 Accessing Asset Liability Management, Detail Cash Flow Results for Audit Purposes

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 ALM Process - Audit Block, the detailed cash flow results are written to the FSI_O_PROCESS_CASH_FLOWS table.

Navigate to **Application Preferences** and select **Maximum Number of Instrument Records** to include in Detail Cash Flow Output.

8.27 Accessing Asset Liability Management, Interest Rate Audit Results

Forecast Rates, Implied Forward Rates, and Stochastic – One-Month Rates can be written to an audit table to facilitate validation of results and for reporting and analysis in ALM BI.

Within the ALM Process - Audit Block, selecting the Forecast Rates option allows you to output the interest rates, currency rates, and economic indicator values for each scenario used in your ALM simulation run.

When running a stochastic ALM process, because 360 One-Month Rates are written out for each rate path, selecting the rate output option will result in a large amount of rate data being written to the Interest Rates Audit table.

Both the Deterministic – Forecast Rates and the Stochastic One Month Rates audit results are written to the FSI_INTEREST_RATES_AUDIT table.

8.28 Analyzing Results

You should always analyze results obtained from the ALM 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.

Also, 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.

This type of review is performed by analyzing the seeded reports delivered as part of the ALM Business Intelligence application. Many times, administrators and power users must analyze data and confirm processing results by running queries directly against the relational data prior to releasing reports for analysis through Oracle Business Intelligence.

The following relational database tables are populated with ALM Static Deterministic and Dynamic Deterministic process results and can be queried directly by a SQL query tool such as Oracle SQL Developer.

Table 8-9 List of Database tables of process results

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 or base currency.	<pre>select * from FSI_O_RESULT_MASTER where result_sys_id=xxxxxx order by start_date_index, scenario_num, product_id;</pre>
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, and Principal Cash Flow, and so on. Result Detail data is stored in original or base currency.	<pre>select * from res_dtl_xxxxxx order by start_date_index, scenario_num, product_id, financial_elem_id, result_type_cd;</pre>
Consolidated Master	The Consolidated Master table is populated only when processing data containing multiple currencies and the Consolidate to Reporting Currency option is selected. The data in this table will be expressed in a single designated currency (reporting currency), but will otherwise have the same structure as described above for Result Master.	<pre>select * from fsi_o_consolidated_master where result_sys_id=xxxxxx order by start_date_index, scenario_num, product_id;</pre>

Consolidated Detail	The Consolidated Detail table is populated only when processing data containing multiple currencies and the Consolidate to Reporting Currency option is selected. The data in this table will be expressed in a single designated currency (reporting currency), but will otherwise have the same structure as described above for Result Detail.	<code>select * from cons_dtl_xxxxxx order by start_date_index, scenario_num, product_id, financial_elem_id, result_type_cd;</code>
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The following relational database tables are populated with ALM Static Stochastic and Dynamic Stochastic process results:

Table 8-10 Relational database tables are populated with ALM Static Stochastic and Dynamic Stochastic process results

Table Name	Description	Sample SQL query
Stochastic VaR	VaR results are output and stored in this table for each Product COA member included in the process.	<code>select * from fsi_o_stoch_var where tm_process_sys_id = xxxxxx order by leaf_node, probability;</code>
Stochastic Total VaR	VaR results are output and stored at the portfolio level in this table.	<code>select * from fsi_o_stoch_tot_var where tm_process_sys_id = xxxxxx order by probability;</code>
EAR Leaf Average	Earnings at Risk results are output and stored at the Product COA level as an average amount across all of the selected rate paths.	<code>select * from ear_leaf_avg_xxxxxx order by end_date, leaf_node;</code>
EAR Leaf Detail	Earnings at Risk results are output and stored at the Product COA level for each rate path selected in the process.	<code>select * from ear_leaf_dtl_xxxxxx order by rate_path_num, end_date, leaf_node;</code>
EAR Total Average	Earnings at Risk results in this table are aggregated to include only net interest income and net income and are shown as an average amount across all the selected rate paths.	<code>select * from ear_total_avg_xxxxx order by end_date;</code>
EAR Total Detail	Earnings at Risk results in this table are aggregated to include only net interest income and net income and shown for each rate path.	<code>select * from ear_total_dtl_xxxxxx order by rate_path_num,end_date;</code>

During Stochastic processing, if source data is expressed in multiple currencies, it is converted to reporting currency at the start of processing.

8.29 Reprocessing Erroneous Accounts

When reviewing your results, you might discover accounts with invalid results that must be reprocessed. Oracle ALM Processes allow you to rerun a subset of information to make corrections to appropriate products when required.

If you must reprocess a portion of your instrument data, ensure that you reprocess all the Product dimensions members, across all instrument tables where relevant data exists.

8.30 Consolidation of Results

Usually, users have to create multiple ALM processes to meet various functional and non-functional requirements. Once executed, the results generated in ALM are identified by different system IDs. For reporting, you may want to combine the result sets from multiple processing runs.

For more information on how results from multiple ALM processes can be merged, see the *Consolidation of Results* section in the Oracle Financial Services Cash Flow Engine Reference Guide.

9

Common Rule Management Tasks

The rule management tasks that are common to business rules in this and other OFSAA applications are as follows.

This section focuses on the rule management tasks that are common across all rules in this application.

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.



Note:

You can perform these tasks from the Summary page for the rule type with which you are working. Depending on the rule type, some tasks might not be available.

Topics

- [Rule Summary Page](#)
- [Searching for Rules](#)
- [Creating Rules](#)
- [Viewing and Editing Rules](#)
- [Copying Rules](#)
- [Deleting Rules](#)
- [Dependency Checking](#)

9.1 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.

For example, the following table shows the Rule Summary page components of the Payment Pattern Rule.

Table 9-1 List of key terms used in Common Rule Summary page

Name	Description
Folder	Filter the rules under the folder. The default value must be set in Application Preferences.

Table 9-1 (Cont.) List of key terms used in Common Rule Summary page

Name	Description
(Rule) Name	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	The default value must be set in Application Preferences.
Search	Initiates rule search based on specified criteria.
Reset	Restores default search criteria.
Add	Initiates the Data or Ledger Loader rule creation process
(Rule) Name	Hover over this to show the rule description and in some cases also displays the unique system ID number.
Created By	Shows who created the Rule version.
Creation Date	Shows when the Rule was created.
Last Modified By	Shows who last modified the rule.
Last Modified Date	Shows when the rule was last modified.
View	Opens the selected rule in read-only mode.
Edit	Opens the selected rule in edit mode.
Delete	Deletes the selected Rule.
Copy	Initiates the process for copying rules.
Run	Initiates the process for running Rules.
Pagination Options	Indicates the number of rows to display per page in the summary table. The default value must be set in Global Preferences.

9.2 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 for a rule, follow these steps:

1. Navigate to the **Rule Summary** page for the appropriate rule type.
2. Select the folder from the **Rule Summary** page in which the rule is stored.
3. (Optional) Enter the name of the rule.
4. Click **Search** button.
Only rules that match the search criteria are displayed.

To search for a rule in Cash Flow Edit, follow these steps:

1. Navigate to the **Rule Summary** page for the appropriate rule type.
2. Click Search button in the Search area .
3. Enter Rule name, description, or select folder, and then click Search.

4. When you click Search, depending upon the search criteria, this filters, and displays the relevant search combination parameters under the Rule Summary as a list.

9.3 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, follow these steps:

1. Navigate to the **Rule Summary** page of the Rule you want to create. Every rule has a separate Summary page.
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.
(Optional) Enter a description for the rule.
5. Select the required access for other users.
6. Click **Apply** or **Save**, depending on the rule type.
7. Specify any other properties or options that may apply for the rule that you are creating.

To create a new rule/process in Cash Flow Edit window, follow these steps:

1. Navigate to the **Rule Summary** page of the Rule you want to create. Every rule has a separate Summary page.
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.

9.4 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, 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 [Searching for Rules](#) section.
3. Select the appropriate rule and click **Edit** to open the rule you want to update.
4. Update the Name or Description.
5. Click **Apply** or **Save**, depending on the rule type.

To view and edit a rule in Cash Flow Edit window, 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 [Searching for Rules](#) section.
3. Click in the **Action** column and select **View/Edit** to open the rule you want to update.
4. Update the rule details.
5. Click **Apply** or **Save**, depending on the rule type.

9.5 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, follow these steps:

1. Navigate to the **Rule 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** 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.
6. (Optional) Enter a brief description of the rule.
7. Select the access type.
8. Click **Save** button.

To copy a rule in Cash Flow Edit window, follow these steps:

1. Navigate to the **Rule Summary** page of the rule you want to copy.
2. Search for a Rule.
For more information, see the [Searching 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.

9.6 Deleting Rules

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 rules.
- You cannot delete a rule that has a dependency.

To delete a rule, follow these steps:

1. Navigate to the **Rule 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 **Delete**.
For more information, see the Overview of Common Rule Management Tasks section.

To delete a rule in Cash Flow Edit window, follow these steps:

1. Navigate to the **Rule Summary** page of the Rule you want to delete.
2. Search for a Rule.
For more information, see the [Searching for Rules](#) section.
3. Click in the **Action** column and select **Delete**.

9.7 Dependency Checking

You can check dependencies for rules to know where a particular rule, dimension, member, attribute, IRC has been used. This also prevents accidental deletion of rules having dependencies.

To check the dependency of a rule, follow these steps:

1. Navigate to the **Rule 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 or rules 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, and Folder.

For example, 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.

To check the dependency of a rule in Cash Flow Edit window, follow these steps:

1. Navigate to the **Rule 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. Click in the **Action** column and select **Dependency Check** to the rule that you want to check for.

10

Application Preferences

This chapter discusses the procedure to define and maintain the ALM Application Preference settings.

Application Preferences allow Administrators and End Users to establish default values, manage other core application parameters that affect the way business rules are created and the way Asset Liability Management Processes are run.

Topics:

- [Updating Application Preferences](#)

10.1 Updating Application Preferences

To update the Asset Liability Management Application Preferences, follow these steps:

1. Navigate to the **Asset Liability Management Application Preferences** page.
2. Input values for all the Asset Liability Management Application Preference items as described in Table 1.

If you are the application administrator, define default values for the **All User** group by making the appropriate selection from the **Show Preference For**, drop list at the top of the page. Pay particular attention to the **Is Editable** status and determine which items require administrative control and which items non-administrative users will be able to set for themselves.

The following table describes each of the Asset Liability Management Preference items.

Form fields to define the Application Preference settings for ALM application

Term	Description
Show Preferences For	<ul style="list-style-type: none"> Administrator: If you have Administrator privileges, you can define preferences for the All User group and their individual account, which may be the same or different from the All User settings. The Administrator can also designate the All User preferences as Editable or Non-editable on a row by row basis. If the individual preference is selected as is Editable, then End Users can update or override the Administrator's default value for their own individual account. If the is Editable box is deselected, then End Users cannot change the default for their individual account. End-User: If you do not have administrator privileges, then certain preference items may have been pre-set by the administrator and the you may not be allowed to change the value. All Application Preference settings are displayed, regardless of access privilege.
Active for Master Maintenance	<p>If you have more than one application available on their LHS menu, then you must designate Application Preferences from one of the applications as Active for Master Maintenance. Certain preferences such as the default folder and read/write access setting will be referenced by items within Master Maintenance based on this selection.</p>
Security Map	<p>This option allows you to select an existing security map. Security Maps can be used to control the dimensions and dimension members each user can access when building and executing rules. For more information on Security Mapping, see the Oracle Financial Services Analytical Applications Infrastructure (OFSAAI) User Guide.</p>
As of Date	<p>All processes reference this date at runtime to determine the data to include in the process. The As-of-Date value you set in Application Preferences applies to interactive job execution (that is, when you choose to execute a rule directly from a Summary window). For batch processing, the As-of-Date is derived from the Information Date.</p>
Show Execution Parameters	<p>If this option is selected, a pop-up window appears whenever you execute a process interactively from a Summary window. Within this pop-up window, you may confirm or modify your run execution parameters (As-of-Date and Legal Entity).</p>

Term	Description
Legal Entity	<p>Similar to As-of-Date, all processes reference Legal Entity at run time to determine the data to include in the process. The value of Legal Entity you set in Application Preferences applies to interactive job execution (that is, when you choose to execute a process directly from a Summary window) and batch processing (that is, when you choose to execute a process from Simplified Batch).</p> <p>NOTE: Legal Entity is designed to support implementations that require multi-entity or multi-tenant functionality. For details, see Appendix: Multi-Entity. If your implementation does not require this functionality, you may utilize the Default Legal Entity in all your processes.</p> <p>No additional parameter is required for Legal Entity for command-line execution. EPM Engines read the default Legal Entity from the Application preference value saved for the User who is executing from the command-line. The default legal entity is a per user preference setting. To set this, the following steps are required:</p> <ol style="list-style-type: none">1. Create a security-map in AAI containing the legal-entity hierarchy as an application admin. Set the default security-map in a user preferences.2. Navigate to Execution Parameters block in user-preferences and choose the default legal-entity member.3. If you do not want to use the Multi-Entity feature with Security, you need to save the Application preference for the user executing the batch. The usual choice for Legal Entity would be Default Member in Application preferences. <p>Default implies -1 code.</p> <p>Default value for Legal Entity dimension column in all instrument and ledger table is -1</p>
Disable Legal Entity	<p>If the Disable Legal Entity checkbox in application preferences window is checked, then Legal Entity will no longer be a run-time parameter. This is an optional parameter.</p>
Default Total Error Message Limit	<p>ALM Processes log error details into the FSI_PROCESS_ERRORS table. This parameter defines the limit on the total number of errors that will be logged for any ALM Process.</p>
Default Error Message Limit Per Item	<p>This parameter defines the total number of errors that will be logged for a given type of error.</p>

Term	Description
Debugging Output Level	<p>The debugging output level determines the amount of SQL that will be written to the processing log. There are three levels available:</p> <ul style="list-style-type: none"> Do not output SQL to log file: A log file will not be created. · Show Significant Calculation SQL: Log file is created and will contain those SQLs that are tagged as significant. · Show all SQL: Log file is created and will contain all the SQL that the engines execute. <p>The log files can be accessed by the system administrator in the following location on the server: \$FIC_HOME/ficdb/log/FusionApps/ folder</p> <p>The file names will be prefixed with the application initials and will also contain the unique batch run id of the execution request. for example: ofsrn.<batch-run-id>.log</p>
Maximum Number of Instrument Records to Include in Detail Cash Flow Output	<p>This parameter allows administrators to define the maximum number of instrument records that any user can select within a process for outputting detailed cash flows. In Oracle ALM, there is no limit for this value. If you wish to remove the limit, you can leave the setting blank and upon selecting Apply, you will notice “No Limit” text will appear. It is recommended, however, that this value be set to 100 or less.</p>
Maximum Number of Rate Paths for Monte Carlo Processing	<p>This parameter allows administrators to limit the number of rate paths that can be selected by a user when running a Monte Carlo based process. The maximum value is 2100.</p>
Random Number Generation Seed Method	<p>Determines the type of random number generation seed method for Monte Carlo processing. Selections include Fixed Seed (default) and Variable Seed.</p>
Initial Seed Value	<p>The Initial seed value input is available when the Seed Value Method is Fixed Seed. The default value is zero.</p>

Term	Description
Enable Holiday Calendar Adjustments	<p>Select this option to enable the Holiday Calendar Adjustment capability for the ALM Application. If this option is not selected, the ALM Cash Flow Engine will ignore all Holiday Calendar information, including instrument level inputs and assumption rule level inputs.</p> <p>Logic for applying Holiday Calendar assumptions is as follows:</p> <ul style="list-style-type: none"> · If Application Preferences – Enable Holiday Calendar Adjustments is checked, then the CFE will handle Holiday Calendar assumptions based on the Account Level values first. · If Application Preferences – Enable Holiday Calendar Adjustments is checked but Holiday Calendar inputs are not defined at the Account Level, then the CFE will refer to the Product/Currency assumptions (TP rule and Adjustment rule). · If Application Preferences – Enable Holiday Calendar Adjustments is checked and Holiday Calendar inputs are defined at both the Account Level and Product/Currency Assumption level, then the CFE will refer to the Account level inputs. · If Application Preferences – Enable Holiday Calendar Adjustments checkbox is off, then no Holiday Calendar assumptions will be applied regardless of data or Product/Currency Holiday Calendar definitions. Data that specifies Bus/252 accrual basis will get processed as Actual/Actual, and a process error message will be populated: Invalid record: BUS/252 Accrual Basis is selected and no Holiday Calendar is defined. Defaulted to ACT/ACT leaf member.
Folder Name	<p>This parameter allows you to define the default folder selection. The folder selection for all rule types will be defaulted to this selection within the summary page search window and when creating a new rule. This selection acts as the starting value for convenience only and users can change to any other available value at their discretion.</p>
Access Type	<p>This parameter allows you to set the default access type setting. Selections include Read / Write and Read Only. This selection acts as the starting value for convenience only and users can change at their discretion.</p>
Initial Currency Selection (Business Rule Currency)	<p>This parameter allows you to select the starting currency to be displayed within all business rules. This selection is made for convenience and can be changed within all business rules at the users' discretion.</p>

Term	Description
Product Dimension	<p>Oracle ALM requires users to declare one of the “Product” dimensions as the ALM Product dimension. The model is seeded with 3 possible selections:</p> <ul style="list-style-type: none"> · Product · Common COA · GL Account <p>Users can also add user-defined product dimensions, which would also appear in the above list. ALM business rules are based on the Product dimension selected here. The suggested default is the “Product” dimension.</p> <p>NOTE: If the process is using Product Dimension as "Product", do not use Default Product Member (value of -1) within the process.</p>
Organizational Unit Dimension	<p>Org Unit ID is the standard organizational dimension in the OFSAA relational data model and is intended to equate to the organizational dimension found in the General Ledger (e.g., Cost Center, Responsibility Center, Department, etc). Unless Users have defined additional Organizational dimensions, the Organizational Unit Dimension is set by default to Org Unit ID. For details on adding new key processing dimensions, see Adding Dimension Tables and Key Dimension (Leaf) Registration in the OFSAA Data Model Utilities Guide. If Users have defined additional Organizational dimensions, then they may select any Org type dimension to serve as their Organizational Unit Dimension.</p>
Hierarchy Members Navigation Size	<p>This parameter allows you to specify the maximum number of members that a parent node within a Hierarchy or Assumption Browser can show at a given time. When you expand a branch in a Hierarchy or Assumption Browser and the number of members in that branch exceeds the specified Navigation Size, it will provide "More" and "Previous" options to enable you to navigate through the member list.</p> <p>NOTE: Recommended values for Navigation Size are 50 to 100. Higher value settings could impact window refresh performance. The UI allows you to enter a value up to 10000.</p>

Term	Description
Autobalancing Leaves	<p>Autobalancing leaves allow you to assign dimension members to the various elements of the Autobalancing process. Autobalancing in ALM is commonly used when running simulation scenarios that require the balance sheet to remain in balance throughout the forecast horizon. The following Leaf types require dimension member assignments for the autobalancing process to run:</p> <ul style="list-style-type: none">Purchase of overnight funds to fill in cash shortfalls or sale of overnight funds to invest excess cash:AssetsLiabilitiesRoll net income into retained earningsRetained EarningsPay DividendsDividendsPay Federal and Local TaxFederal TaxesState TaxesAccumulate unrealized currency gains/losses in equityAccumulated Translation Balance <p>Note: All product COA dimension members mapped for use in autobalancing must have the correct account type attribute (via Common COA mapping) and all components must be mapped for the process to run. Also note, that each autobalancing element should have a unique dimension member assignment.</p> <p>Mapping of Dimension members:</p> <ul style="list-style-type: none">Select the Product Hierarchy.Identify the Autobalancing Leaf type and select the product member using the Hierarchy Browser.Define the Product Characteristics for the above selected product member.During the processing, select the Product Characteristics definition for which autobalancing is defined. <p>NOTE: Also, Autobalancing Leaves option (navigate to ALM Processing and select Processing Parameters) should be selected.</p>

Term	Description
National Housing Price Index (NHPI)	This is an input parameter for ADCo definition purpose, that the user has to select from the drop-down list containing the list of all economic indicators defined from Rate Management. The user is required to set up an NHPI economic index as if they desire to override the base ADCo NHPI forecast. This is an optional step, in the setting up of an ADCo process.

3. Select **Apply** to confirm the changes.
4. Select the **Reset** to default option if you would like to clear all previously applied inputs and return to the original default state.

11

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.

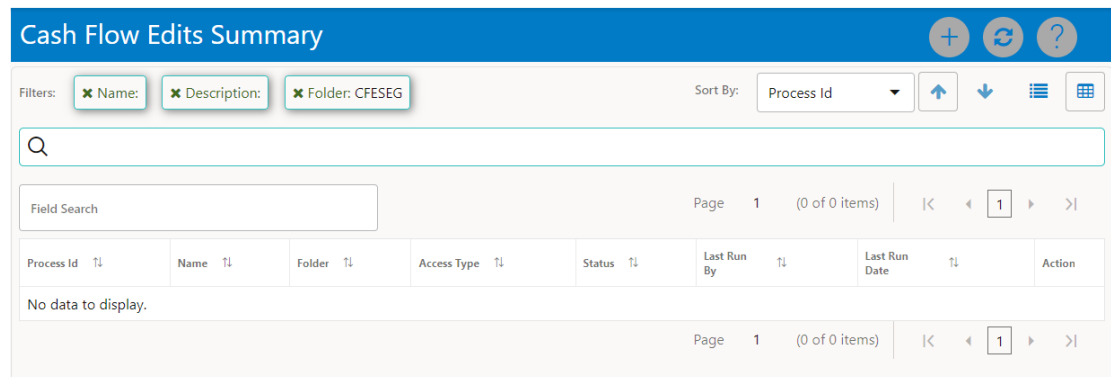
The cash Flow Edit process allows you to verify the accuracy and check the completeness of your Instrument table data.

The procedure for working with and managing a Cash Flow Edit process is similar to that of the Oracle Cash Flow Engine processes.

Topics

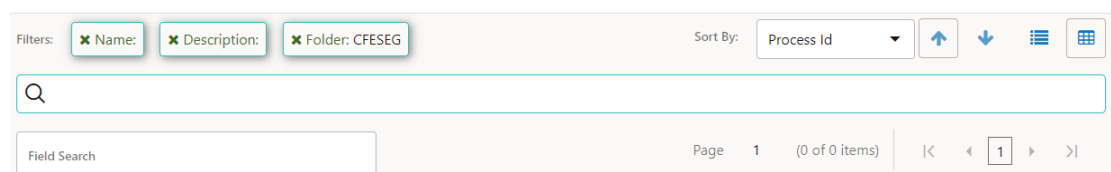
- [Creating Cash Flow Edit Process](#)
- [Executing Cash Flow Edit Process](#)
- [View Cash Flow Edit Process Execution Details](#)

Figure 11-1 Cash Flow Edit Summary page



The definitions based on the search criteria are listed under 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 11-2 Searching Cash Flow Edits



The Cash Flow Edits Summary window displays the following columns.

Table 11-1 Cash Flow Edits rule – Fields and Descriptions

Column	Description
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 runs 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.

Table 11-2 Cash Flow Edit rule – Icons and Descriptions

Fields	Description
Add	Click Add icon to build a new Cash Flow Edit rule.
View/Edit	Click on the Action icon against the Rule Name and select View/Edit to view or edit the contents of a Cash Flow Edit rule in read/write format.
Save As	Click on the Action icon against the Rule Name and select Save As to create a copy of an existing Cash Flow Edit rule.
Delete	Click on the Action icon against the Rule Name and select Delete to delete an existing Cash Flow Edit rule.
Execute	Click on the Action icon against the Rule Name 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 Executing Cash Flow Edit Processes section.
Execute Details	Click on the Action icon against the Rule Name 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.

11.1 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 11-3 Cash Flow Edit of CFE Processing

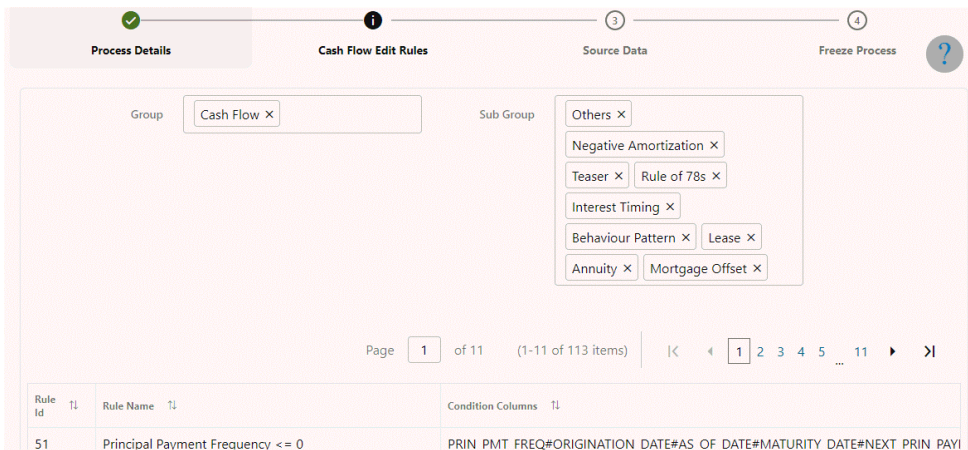
3. Enter the process details shown in the following table.

Table 11-3 List of process details used for Creating Cash Flow Edit Process

Parameter	Description
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 11-4 Creating Cash Flow Edits Rule



5. Enter the Cash Flow Edit details shown in the following table.

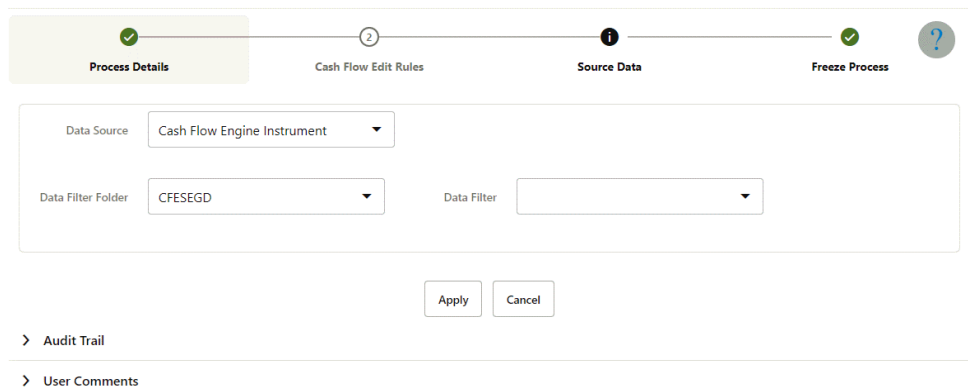
Table 11-4 List of Cash Flow Edit details used for Creating Cash Flow Edit Process

Parameter	Description
Group	Select the group of Cash Flow Edit Rules that you want to include in the process. For example, Cash Flow
Sub Group	Select the sub group of Cash Flow Edit Rules that you want to include in the process. The value of this field varies based on the selected Group. The list of Rule Ids with conditions is displayed.

Detail of rules for the selected group and sub-group are listed on the screen for reference.

6. Click **Apply** to navigate to the Source Data section.

Figure 11-5 Creating Cash Flow Edits Rule



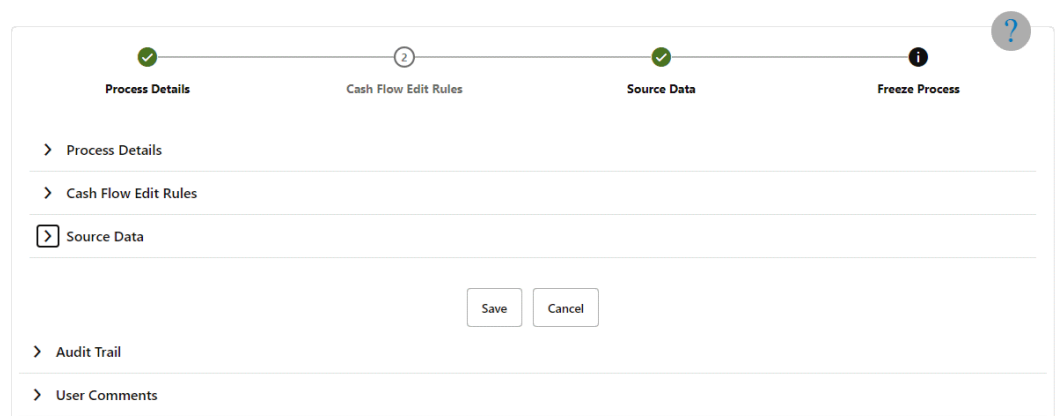
7. Enter the Source Data details shown in the following table.

Table 11-5 List of Source Data details used for Creating Cash Flow Edit Process

Parameter	Description
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 Folder from which you want to apply Data Filter
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 11-6 Creating Cash Flow Edits Rule



The Cash Flow Edits process is saved and the Summary page is displayed.

11.2 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_CFE_MESSAGES_MLS table for generated errors before the system updates the underlying records in the Instrument tables.

You can execute Cash Flow Edit process using following methods:

- [Cash Flow Edit UI](#)
- [Batch Maintenance](#)

11.2.1 Using Cash Flow Edit 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.

Figure 11-7 Using Cash Flow Edit UI

Run Execution Parameters [X]

Process Name: Reprice_Abs-Flat

As Of Date: [Calendar Icon] Required

Legal Entity: [Tree Icon] [Document Icon]

[Run] [Reset] [Cancel]

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.

11.2.2 Batch Based Procedure

Cash Flow Processes can also be executed as batch processes. The following approaches are available:

- ICC Batch

To execute the batch with ICC Batch, 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. 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 fields "Datastore Type", "Datastore Name", "Primary IP For Runtime processes".
8. Input the following required parameters:
 - Object ID: \$objectId
 - Workflow: "CASH_FLOW_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.

11.3 View Cash Flow Edit Process Log

To view the cash flow edit errors, warnings, and info, navigate to 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 Cash Flow Edits Execution.

Figure 11-8 View the Task Details

The screenshot shows the Batch Monitor interface. At the top, there are dropdown menus for 'Information Date' (set to 20210113) and 'Batch Run ID' (set to OFSCFEINFO_1610538617081_20210113_1). A 'Monitor Refresh Rate (seconds)' field is set to 5. Below this, a table shows the 'Batch Status' for the selected run, which is 'Failed'. Underneath, the 'Task Details' section shows a table with one task: 'CashFlowEditsExecution' with a status of '[10105] Failed'. The interface includes pagination controls at the bottom, showing 'Page 1 of 1 (1-1 of 1 items)' and 'Records Per Page 15'.

Batch Run ID	Batch Status
OFSCFEINFO_1610538617081_20210113_1	Failed

Task ID	Task Description	Metadata Value	Component ID	Task Status	Task Log
<input checked="" type="checkbox"/> Task1	CashFlowEditsExecution	CashFlowEditsExecution	TRANSFORM DATA	[10105] Failed	View Log

4. Click **View Log**.

12

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

The procedure for working with and managing Behavior Patterns includes the following steps:

- [Searching for Behavior Pattern](#)
- [Creating a Behavior Pattern](#)
- [Viewing and Editing Behavior Patterns](#)
- [Copying Behavior Patterns](#)
- [Deleting Behavior Patterns](#)

12.1 Creating 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, perform the following:

1. Navigate to the **Behavior Pattern Summary** Page.
2. Click **Add** to display the Behavior Pattern Details Page.

Figure 12-1 Behavior Patterns Details Page

Tenor	Multiplier	Allocation Input Type	Percentage	Type
	Months			Volatile

3. Enter a unique Numeric Code for the new Behavior Pattern. The code is must be mapped the appropriate instrument record's AMRT_TYPE_CD and BEHAVIOUR_PATTERN_CD 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.
6. Define the Behavior Pattern Tenor Specifications for the Maturity Branches.
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. For more information, see:
 - [Defining Non-Maturity Behavior Patterns](#)
 - [Defining Non-Performing Behavior Patterns](#)
 - [Defining Devolvement and Recovery Behavior Patterns](#)

**Note:**

The Behavior Pattern Details Page above 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 payment specifications section corresponding to the new Pattern Type get refreshed. 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.

12.1.1 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, perform the following steps:

1. In the **Behavior Pattern Details** Page, select **Devolvement and Recovery** as the Behavior Pattern Type.
2. Click the **Add** icon to open the Non-Performing Behavior Patterns Summary Page.
3. 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.
- **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 Devolvement:** 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.

4. Click the **Add** icon to add additional payment strips to the Pattern and define appropriate assumptions for each strip.
5. To delete a row, select the check box corresponding to the row(s) you want to remove and click the **Delete** icon.
6. Click **Save**.

The Behavior Pattern is saved and the Behavior Pattern Summary Page is displayed.

12.1.2 Defining Non-Maturity Behavior Patterns

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, follow the Manual Method.

For Manual Model, you can perform the following steps:

1. In the Behavior Pattern Details Page, select Non Maturity as the Behavior Pattern Type.
2. Select Non-Maturity Products Profile Method as Manual.
3. 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 as follows:
 - Days

- Months
 - Years
 - Allocation Input Type: This field has a default value of Percentage for each maturity tier.
 - Percentage: The outstanding balance indicating how much of the outstanding balance will mature on the specified term. Enter a number 0 and 100.
 - 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.
4. Click the **Add** icon to add additional payment strips to the Pattern. After defining the initial strip as Volatile, subsequent strips are usually classified as Core with varying maturity terms assigned.

 **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 **Add Multiple Row** icon to open a window. Enter the number of rows you want to add and click Add Rows.
6. The **Upload Excel** icon helps you to upload the Behavior Pattern information to an Excel Sheet. This feature will be available in future.
7. To delete a row, select the check box corresponding to the row you want to remove and click the Delete icon.
8. Click **Save**.

The Behavior Pattern is saved and the Behavior Pattern Summary Page is displayed.

12.1.3 Defining Non-Maturity Behavior Patterns (for Tractor TP Method use)

 **Note:**

This is applicable only for FTP application.

The Tractor Transfer Pricing Method, utilizes a replicating portfolio concept. Replicating Portfolio's 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 (e.g. typically 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.

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 the following details:

Table 12-1 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 Amount and Percentage. If the Non-Maturity profile method is selected as the Non-Maturity Products Model, then allocation will always be in 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 , 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 , 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 sets 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: <ul style="list-style-type: none"> • Days • Months • Years
Type	For replicating portfolio, type is defaulted to 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.

Table 12-1 (Cont.) Key Terms used in the Behavior Pattern Details page

Term	Description
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 the user to define the source Instrument Table (or Ledger Table) and product / currency against which the core balance will be reconciled. The difference between the core balance and the actual instrument balance will determine the amount of the Volatile Plug strip for the current period.
Balance Type	The Balance type allows you to select the type of the Balance. It can be either Average Balance or Ending Balance. This option will be enable 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. In addition, 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.
Holiday Calendar Rolling Convention	The rolling convention within replicating portfolios is defaulted to 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 default rolling frequency of replicating portfolio.
Merge Delta Strips on Re-balancing	If Merge Delta Strips on Re-balancing option is enabled, then the core strips will be merged during the rebalancing.

Table 12-1 (Cont.) Key Terms used in the Behavior Pattern Details page

Term	Description
Generate the Portfolio	<p>After initially creating (and saving) the replicating portfolio definition, users should Generate the Portfolio. This action launches a background process which generates the strip records for the portfolio. Prior to 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.</p> <p>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).</p>
Roll the Portfolio	<p>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 in application preferences prior to running the Roll Portfolio Process.</p>
Re-balance the Portfolio	<p>After rolling the portfolio, users will need to re-balance the portfolio. There are two options provided for re-balancing:</p> <ul style="list-style-type: none"> • Plug to Volatile Strip: This option should be selected when no changes to the core allocation have been 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. <p>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.</p> <ul style="list-style-type: none"> • 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	<p>This option allows you to view the portfolio strips.</p>

This table describes various fields in 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. Click Add Core (one or more) to input the core amount, associated maturity term and strip frequency.
5. To delete a row, select the check box corresponding to the row you want to remove and click Delete.
6. Click Save.
The Behavior Pattern is saved and the Behavior Pattern summary page is displayed.
7. 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:**

Once 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 Portfolio's have been updated.

12.1.4 Defining Non-Performing Behavior Patterns

Non-Performing Behavior Patterns are commonly used for balances that are classified as non-earning assets. These balances are typically 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, perform the following steps:

1. In the Behavior Pattern Details Page, select **Non-Performing** as the **Behavior Pattern Type**.
2. Click the **Add** icon to open the **Non-Performing Behavior Patterns Summary** Page.
3. 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.
- **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.

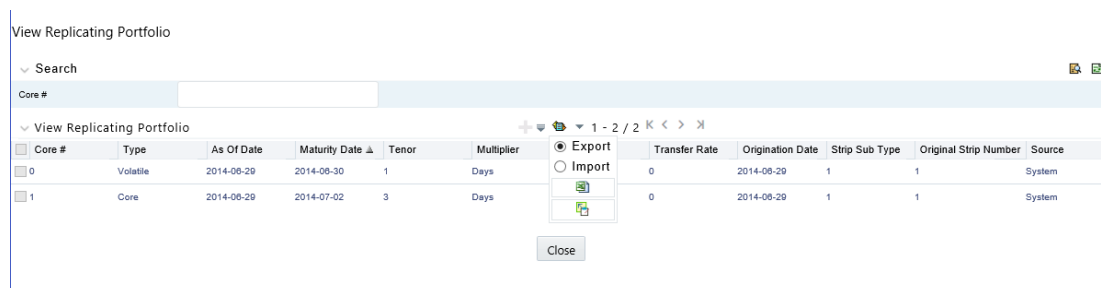
4. Click the **Add** icon to add additional payment strips to the Pattern and define appropriate assumptions for each strip.
5. To delete a row, select the check box corresponding to the row(s) you want to remove and click the **Delete** icon.
6. Click **Save**.

The Behavior Pattern is saved and the **Behavior Pattern Summary** Page is displayed.

12.1.4.1 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.

Figure 12-2 Export and Import Replicating Portfolio Data in Excel



The following screen shot illustrates the functionality:

- 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 Core's. Additionally, the selection of Strips can span multiple pages, for example - as seen in the preceding screen shot, 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 have been imported.
- When you click Strip Source option, the status column in the summary table shows the tagged strip records that have been created by system or manually. You can edit these tags for strips that are manually created or existing strips after exporting them into Excel.

Figure 12-3 Excel Sheet

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Core	Type	As of Date	Maturity Date	Tenor	Multiplier	Allocation	Transfer Rate	Origination Date	Strip Sub Type	Original Strip Number	Strip Source				
2	1	Core	29-Jun-2014	02-Jul-2014	3	D	4	0	29-Jun-2014	1	1	System				
3	0	Volatile	29-Jun-2014	30-Jun-2014	1	D	4	0	29-Jun-2014	1	1	System				
4																
5																

12.1.4.2 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 have the ability to 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

To open the Simplified Batch process screen, from the LHS menu, select Common Object Maintenance, select Operations, and then select Simplified Batch to open the Simplified Batch process page. This page is the gateway for defining the batch processes for behavior pattern batch process and related functionality.

The following screen shot illustrates these tasks selected within a Simplified Batch process.

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",""
```

12.2 Viewing and Editing Behavior Patterns

You can view existing Behavior Pattern, and you can edit existing rules, provided you have read/write privileges.

To view and edit a Behavior Pattern, follow these steps:

1. Navigate to the **Behavior Pattern Summary** page of the pattern you want to update.
2. Search for a pattern. For further information, see the [Searching for Rule](#) section.
3. Select the appropriate pattern and click **Edit** to open the pattern you want to update.
4. Update the Name or Description.
5. Click **Apply** or **Save**, depending on the pattern type.

12.3 Copying Behavior Patterns

You can copy patterns to avoid having to enter data multiple times. This saves time and effort and also reduces mistakes.

To copy a Behavior Pattern, follow these steps:

- Navigate to the **Behavior Pattern Summary** page of the pattern you want to copy.
- Search for a pattern
For more information, see the [Searching for Rule](#) section.
- Select the appropriate pattern and click **Copy** to duplicate the pattern.
- Select a folder where you want to save the pattern copy.
- Enter a unique name for the new pattern.
(Optional) Enter a brief description of the pattern.
- Select the access type.
- Click the **Save** button.

12.4 Deleting Behavior Patterns

You can delete patterns that are no longer required.

 **Note:**

A rule cannot be retrieved after deletion.

Restrictions on deleting patterns are:

- You cannot delete patterns if you have only Read privileges. Only users with read/write privileges and pattern owners can delete rules.
- You cannot delete a pattern that has a dependency.

To delete a Behavior Pattern, follow these steps:

1. Navigate to the **Behavior Pattern Summary** page of the pattern you want to delete.
2. Search for a pattern. For more information, see the [Searching for Rule](#) section.
3. Select the appropriate pattern and click **Delete**

13

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 for the instrument.

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 assumption rules.

Topics

- [Searching for Rules](#)
- [Creating Payment Patterns](#)
- [Viewing and Editing Payment Patterns](#)
- [Copying Payment Patterns](#)
- [Deleting Payment Patterns](#)

13.1 Search for Payment Patterns

Search for a payment pattern to perform any of the following tasks:

- View
- Edit
- Copy
- Delete
- Check Dependencies

Prerequisites

- Predefined Payment Patterns

Procedure

To search for payment patterns, do the following:

1. Navigate to the **Payment Pattern** summary page.

Figure 13-1 Payment Pattern Summary Page

Code	Description	Pattern Type	Creation Date	Created By	Last Modification Date	Last Modified By
<input type="checkbox"/> 1111	hmgf	Absolute	04/25/2018 17:43:14	AUTOUSER	04/25/2018 17:43:14	AUTOUSER
<input type="checkbox"/> 1125	gfbhf	Absolute	04/30/2018 15:03:53	AUTOUSER	04/30/2018 15:06:53	AUTOUSER
<input type="checkbox"/> 1126	hgfx	Absolute	04/30/2018 15:11:34	ALMUSER	04/30/2018 15:11:34	ALMUSER
<input type="checkbox"/> 1127	gfhxf	Split	05/03/2018 12:57:21	AUTOUSER	05/03/2018 12:57:19	AUTOUSER
<input type="checkbox"/> 1128	hsf	Absolute	04/30/2018 15:04:44	AUTOUSER	04/30/2018 15:04:44	AUTOUSER
<input type="checkbox"/> 2135	kigh	Absolute	04/25/2018 17:43:38	AUTOUSER	04/25/2018 17:43:38	AUTOUSER
<input type="checkbox"/> 2136	kgb	Absolute	04/25/2018 17:43:53	AUTOUSER	04/25/2018 17:43:53	AUTOUSER
<input type="checkbox"/> 2156	ukgkj	Absolute	04/25/2018 17:44:28	AUTOUSER	04/25/2018 17:48:08	AUTOUSER

2. Enter the Code or Description of the pattern in Search Criteria.
3. Click the **Search** icon.

Only patterns that match the search criteria are displayed.

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

13.2 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 **Add** icon. The **Add Payment Pattern** page is displayed.
3. Enter a Code value for the new payment pattern. You can also click Generate Code Option in Code field to generate the code automatically.

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. In addition, 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 for pattern.
5. Enter a brief Description for the pattern.
6. Select the Pattern Type: Absolute, Relative, or Split.
7. Select the Payment Type: Conventional, Level Principal, or Non-amortizing.

Note:

The Payment Type option is not available for Split Payment Pattern type.

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](#)

8. Click **Save**.

 **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 loss of data related to any prior selection

13.2.1 Define Absolute Payment Patterns

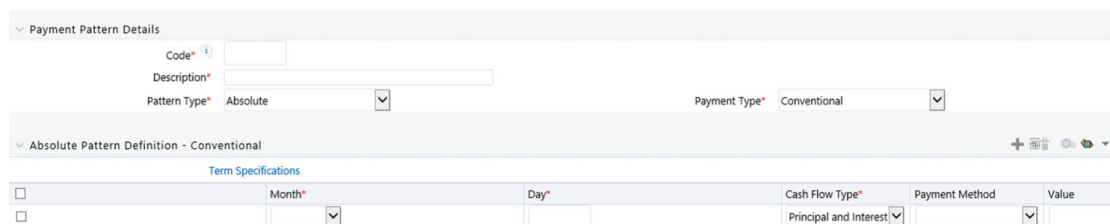
Absolute payment patterns are commonly used for instruments that are on a seasonal schedule, such as agricultural or construction loans that require special payment handling based on months or seasons.

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.

Prerequisites

Selecting Absolute as the pattern type.

Figure 13-2 Absolute Payment Patterns



The screenshot displays the 'Payment Pattern Details' form. The 'Pattern Type' is set to 'Absolute' and the 'Payment Type' is set to 'Conventional'. Below this, the 'Absolute Pattern Definition - Conventional' section is visible, featuring a 'Term Specifications' table. The table has columns for 'Month', 'Day', 'Cash Flow Type', 'Payment Method', and 'Value'. The 'Cash Flow Type' is set to 'Principal and Interest' and the 'Payment Method' is set to 'Principal and Interest'.

	Month*	Day*	Cash Flow Type*	Payment Method	Value
<input type="checkbox"/>			Principal and Interest		

To define absolute payment pattern, do the following:

1. In the **Payment Patterns** page, select **Pattern Type** as **Absolute**.
2. 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.
3. Define the **Payment Phases**. A Payment Phase is a set of payment characteristics that defines the timeline of the instrument's amortization.

- a. 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.
- b. Select the **Cash Flow Type**. The available types depends on the Payment Type. This do not apply to the Non-Amortizing Payment Type.
Table: Relationship between Cash Flow Type and Payment Types

	Level Principal	Non-Amortizing	Conventional
Principal and Interest	Yes		Yes
Principal Only	Yes		
Interest Only	Yes	Yes	

- c. 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.
 - d. 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.
4. Click the **Add** icon to add additional Payment Phases to the Pattern. Click Delete icon corresponding to the rows you want to delete.
 5. Click **Add Multiple Row** icon to enter the number of rows you want to add and click Go.
 6. The **Download Excel** icon helps you to export payment information, modify and paste back in the UI.

 **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.

7. Click **Apply** and Save.

The Payment Pattern is saved and the Payment Pattern summary page is displayed.

The following table describes the relationship between Payment Phase properties and Payment Types.

Table 13-1 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

Table 13-1 (Cont.) Relationship between Payment Phase Properties and Payment Types

	Level Principal	Non-Amortizing	Conventional
Value	Yes		Yes

The following table describes the relationship between Payment Method and Payment Types.

Table 13-2 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
Absolute Payment	Yes		Yes
Interest Only	Yes		Yes

13.2.2 Define Relative Payment Patterns

You create Relative Payment patterns for instruments that have irregular scheduled payments.

Prerequisites

Selecting Relative as the pattern type.

Figure 13-3 Relative Payment Patterns

The screenshot shows the 'Payment Pattern Details' form. The 'Code' is 1001 and the 'Description' is 'Relative Pattern'. The 'Pattern Type' is set to 'Relative' and the 'Payment Type' is 'Conventional'. Below this, the 'Relative Pattern Definition - Conventional' table is visible, containing three rows of payment schedule data:

	Frequency*	Multiplier*	Repeat*	Cash Flow Type*	Payment Method	Value
<input type="checkbox"/>	1	Months	1	Principal and Interest		10.00
<input type="checkbox"/>	1	Months	1	Principal and Interest		10.00
<input type="checkbox"/>	1	Months	1	Interest Only		0.00

To define a relative payment pattern, follow these steps:

1. In the **Payment Patterns** page, select **Pattern Type** as **Relative**.
2. 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. The payment type determines the available characteristics for defining the payment amount.

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.

- a. Enter the **Frequency** for each payment phase.
- b. Select the appropriate Multiplier for each payment phase from the following options:
 - Days
 - Months
 - Years
- c. Enter the number of times each Payment Phase should be repeated in the Repeat column.
- d. Select the **Cash Flow Type**. The available types depend on the Payment Type. This do not apply to the Non-Amortizing Payment Type.

Table 13-3 Relationship between cash Flow Type and Payment Types

	Level Principal	Non-Amortizing	Conventional
Principal and Interest	Yes		Yes
Principal Only	Yes		
Interest Only	Yes	Yes	

- e. Select the **Payment Method**.
The available payment methods depend on the payment type. For more details, see Relation between Payment Method and Payment Types. Payment Methods do not apply to the Non-Amortizing Payment Type.
 - f. Type the Value for the Payment Method you selected in the previous step for applicable Payment Types.
4. Click the **Add** icon to add additional Payment Phases to the Pattern. Click Delete icon corresponding to the rows you want to delete.
 5. Click **Add Multiple Row** icon to enter the number of rows you want to add and click Go.
 6. The **Download Excel** icon helps you to export payment information, modify and paste back in the UI.

 **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.

7. Click **Apply** and **Save**.
The payment pattern is saved and the Payment Pattern home page is displayed.

 **Note:**

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 in 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.

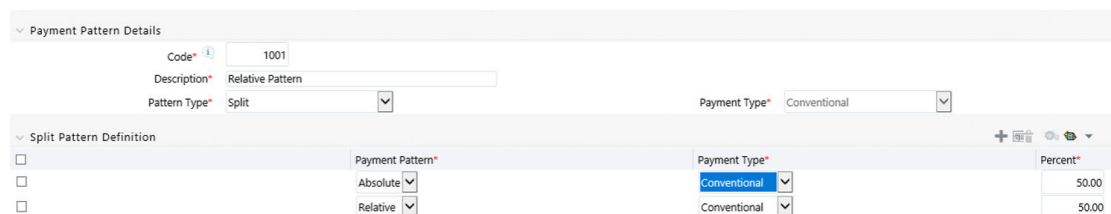
Table 13-4 Relationship between Payment Phases and Payment Types

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

13.2.3 Define Split Payment Patterns

You can 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.

Figure 13-4 Split Payment Patterns



Payment Pattern Details			
Code*	1001		
Description*	Relative Pattern		
Pattern Type*	Split		
Payment Type*	Conventional		

Split Pattern Definition			
	Payment Pattern*	Payment Type*	Percent*
<input type="checkbox"/>	Absolute	Conventional	50.00
<input type="checkbox"/>	Relative	Conventional	50.00

To define a split payment pattern, follow these steps:

1. In the Payment Patterns page, select Pattern Type as Split.
2. Define Split Pattern definition.
 - a. Select the required **Pattern Sub Type** for each leg.
 - Absolute
 - Relative
 - b. Select the Payment Type for each Payment Phase or Split.
 - c. 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%.

 **Note:**

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](#)

3. Select one of the legs and then select **Define** button to enter pattern details for the leg.
4. Select one of the legs and then select **Delete** button to delete pattern details for the leg.
5. Click the **Add** icon to add additional Payment Phases to the Pattern.
6. Click **Add Multiple Row** icon to enter the number of rows you want to add and click Go.
7. Click **Apply** and **Save**.

The Split payment pattern is saved and the Payment Pattern summary page is displayed.

13.3 Viewing and Editing Payment Pattern

You can view existing Payment patterns, and you can edit existing rules, provided you have read/write privileges.

To view and edit a Payment pattern, follow these steps:

1. Navigate to the **Payment Pattern Rule Summary** page of the pattern you want to update.
2. Search for a pattern. For further information, see the [Searching for Rules](#) section.
3. Select the appropriate rule and click **Edit** to open the pattern you want to update.
4. Update the Name or Description.
5. Click **Apply** or **Save**, depending on the pattern type.

13.4 Copying Payment Pattern

You can copy patterns to avoid having to enter data multiple times. This saves time and effort and also reduces mistakes.

To copy a Payment pattern, follow these steps:

- Navigate to the **Payment Pattern Rule Summary** page of the pattern you want to copy.
- Search for a pattern.
For more information, see the [Searching for Rules](#) section.
- Select the appropriate rule and click **Copy** to duplicate the pattern.
- Select a folder where you want to save the rule copy.
- Enter a unique name for the new pattern.
(Optional) Enter a brief description of the rule.
- Select the access type.
- Click the **Save** button.

13.5 Deleting Payment Pattern

You can delete patterns that are no longer required.



Note:

A pattern cannot be retrieved after deletion.

Restrictions on deleting patterns are:

- You cannot delete patterns if you have only Read privileges. Only users with read/write privileges and pattern owners can delete patterns.
- You cannot delete a pattern that has a dependency.

To delete a Payment Pattern, follow these steps:

1. Navigate to the **Payment Pattern Rule Summary** page of the pattern you want to delete.
2. Search for a pattern.
For more information, see the [Searching for Rules](#) section.
3. Select the appropriate pattern and click **Delete**

14

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. You can utilize a Repricing Pattern to generating Cash Flows by entering the Adjustable Type Code as “Repricing Pattern” along with actual Repricing Pattern Code for the relevant Instrument Records.

The procedure for working with and managing Repricing Patterns is, similar to that of other Oracle Business Rules.

Topics

- [Search Repricing Patterns](#)
- [Create a Repricing Pattern](#)
- [View and Edit Repricing Patterns](#)
- [Copy Repricing Patterns](#)
- [Delete Repricing Patterns](#)

14.1 Search Repricing Pattern

Search for a Repricing Pattern to perform any of the following tasks:

- View
- Edit
- Copy
- Delete

Prerequisites

Predefined Repricing Patterns

Procedure

To search the repricing patterns, follow these steps:

- Navigate to the **Repricing Pattern Summary** Page.

Figure 14-1 Repricing Pattern Summary Page

Repricing Patterns As of Date: 06/25/2014

Search Code Description

<input type="checkbox"/>	Code	Description	Pattern Type	Creation Date	Created By	Last Modification Date	Last Modified By
<input type="checkbox"/>	556	egre	Absolute	04/25/2018 17:51:45	AUTOUSER	04/25/2018 17:51:45	AUTOUSER
<input type="checkbox"/>	500	dxhf	Absolute	04/25/2018 17:50:27	AUTOUSER	04/25/2018 17:51:47	AUTOUSER
<input type="checkbox"/>	568	zdfbf	Absolute	04/25/2018 17:51:58	AUTOUSER	04/25/2018 17:51:58	AUTOUSER
<input type="checkbox"/>	501	gsdb	Absolute	04/30/2018 14:43:20	AUTOUSER	04/30/2018 14:43:39	AUTOUSER
<input type="checkbox"/>	503	ghf	Absolute	04/30/2018 14:47:01	AUTOUSER	04/30/2018 14:47:01	AUTOUSER
<input type="checkbox"/>	502	sdg	Absolute	04/30/2018 14:53:32	ALMUSER	04/30/2018 14:53:32	ALMUSER
<input type="checkbox"/>	504	dxghfhtg	Absolute	04/30/2018 14:53:35	ALMUSER	04/30/2018 14:53:35	ALMUSER

- Enter the Code or Description of the pattern in Search Criteria.
- Click the **Search** .
Only patterns that match the search criteria are displayed.

14.2 Create Repricing Patterns

You create Repricing patterns to capture the Repricing Behavior of instruments whose rates change according to complex schedules.

To create the Repricing Pattern, follow these steps:

1. Navigate to Repricing Pattern Summary Page.
2. Click **Add** icon.
The Add Repricing Pattern Page is displayed.
3. Enter a Numeric Code Value for the new Repricing Pattern. You can also click Generate Code Option in Code field to generate the code automatically.
4. Enter the name of the pattern.
5. Type a brief description for the pattern.
6. 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](#)
7. Click **Save**.

14.2.1 Define 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 14-2 Define Absolute Repricing Pattern

Repricing Pattern Details			
Code*	570		
Description*	UDR 570		
Pattern Type*	Absolute		
Repricing Events - Absolute			
	Month*	Day*	Repricing Type*
<input type="checkbox"/>	Initial		Indexed
<input type="checkbox"/>	January	12	Indexed
<input type="checkbox"/>	February	12	Indexed
<input type="checkbox"/>	March	12	Flat

Prerequisites

Selecting Absolute as the pattern type.

Procedure

This table describes key terms used for this procedure.

Table 14-1 Key Terms used in Absolute Repricing Pattern

Key Terms	Description
Add Row	Allows you to add one or more Repricing Events.
Add Multiple Rows	Allows you to add more Repricing Events.
Define	Add detail for each Repricing Event.
Delete	Allows you to delete specific rows in the Repricing Events Table.
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.

To define Absolute Repricing Pattern, perform the following:

1. Select Pattern Type as **Absolute**.
2. 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.
3. Select the Repricing Type: **Flat** or **Indexed**.
The default is flat. If you select Indexed, the system automatically changes the fields available for entry.

Note: You can change your selection of the Repricing Type at any point in this process. Sometimes it may cause a loss of data.

For more information on Flat Repricing Type, see [Repricing Event is Flat Repricing](#)

For more information on Index Repricing Type, see [Repricing Event is Index Repricing](#).

- 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. Balance tier in this case is decided using the principal balance of instrument on As of Date. Thus, even when actual balance goes down due to repayment, the instrument continues to be in original balance tier.
- **Reducing Balance:** If the Balance Type is selected as Reducing Balance, then the repricing rate will be calculated using principal balance as on Repricing Date. Thus, the balance tier applicable to instrument range over its life due to repayment.

4. Click **Define**.

Repricing Event is Flat Repricing

Flat Rate: A Flat Rate is a specific rate—it is directly input.

To define a Flat Rate Event, follow these steps:

1. Select the Flat option from Repricing Method drop-down list for the event you are going to define. Notice the bottom half of the screen refreshes, displaying the required inputs. Complete the following steps on the Add Repricing Events Page:

Figure 14-3 Flat Repricing Pattern Detail Pane

From	Balance Tiers	To	Mix Percentage	Net Rate	Gross Rate	Transfer Rate
0		And Above		0.000000	0.000000	0.000000

Total Mix Percentage: Total Net Rate: Total Gross Rate: Total Transfer Rate:

Apply Cancel

2. Enter the Net Rate.
3. Enter the Gross Rate.
4. Enter the Transfer Rate.

Note:

The Transfer Rate functionality will be released in future.
You must enter a valid value for at least one of these rate fields.

5. Click **Apply**.
The Event Summary Page is displayed. At this point, you have the option of defining additional events or saving. To add an additional event, repeat Click Add Row. You can edit the details of Defined Event.

Repricing Event is Indexed Repricing

An Indexed Rate is a set of parameters used to calculate a rate.

To define an Indexed Rate Event, follow these steps:

1. Select the Indexed option from Repricing Method drop-down list for the event you are going to define. Notice the bottom half of the screen refreshes, displaying the required inputs. Complete the following steps on the Add Repricing Events Page:

Figure 14-4 Indexed Repricing Event Detail

<input type="checkbox"/>	Balance Tiers From	Balance Tiers To	<input checked="" type="checkbox"/> Mix Percentage	Interest Rate Code*	Transfer Interest Rate Code*	<input checked="" type="checkbox"/> Yield Curve Term	<input type="checkbox"/> Net Margin	<input type="checkbox"/> Gross Margin	<input type="checkbox"/> FTP Margin	<input type="checkbox"/> Rate Cap Life	<input type="checkbox"/> Rate Floor Life	<input type="checkbox"/> Rate Set Lag
<input type="checkbox"/>	0	0	0	[USD] 21025352 (7777)	[USD] 21025352 (7777)	2 Months						0 Months

2. Select the Interest Rate Curve.
3. Select the Transfer Price Curve.

 **Note:**

The Transfer Price Curve functionality will be released in the future.

4. Enter the Yield Curve Term and select the appropriate Multiplier.
5. Enter the Net Margin.
6. Enter the Gross Margin.
7. Enter the Transfer Price Margin.
8. Enter the Rate Cap Life.
9. Enter the Rate Floor Life.
10. Enter the Rate Set Lag and select the appropriate Multiplier.
11. Click Apply. The Event Summary Page is displayed.
12. At this point, you have the option of defining additional events or saving. To add an additional event, repeat Click Add Row.
13. Click **Save**.
The Repricing Pattern is saved and the Repricing Pattern Summary Page is displayed.

14.2.2 Define 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 14-5 Define Relative Repricing Pattern

Repricing Pattern Details				
Code*	571			
Description*	UDR 571			
Pattern Type*	Relative			
Repricing Events - Relative				
<input type="checkbox"/>	Frequency*	Multiplier*	Repeat*	Repricing Type*
<input type="checkbox"/>	Initial			Flat
<input type="checkbox"/>	1	Months	1	Indexed
<input type="checkbox"/>	2	Months	1	Flat

Prerequisites

Selecting Relative as the pattern type.

Procedure:

This table describes key terms used for this procedure.

Table 14-2 Key Terms used in Relative Repricing Pattern

Key Terms	Description
Add Row	This allows you to Add one or more Repricing Events.
Add Multiple Rows	Allows you to add more Repricing Events.
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 Method	A drop-down list, it displays the Repricing Type, Flat Rate or Indexed Rate, associated with a particular event.

The steps to create relative Repricing Patterns are similar to creating [Creating Absolute Repricing Patterns](#).

The only difference is that the fields in the Repricing Events Table are different.

Select Pattern Type as Relative and follow the steps mentioned in [Creating Absolute Repricing Patterns](#) section.

14.3 Viewing and Editing Repricing Pattern

You can view existing Repricing Pattern, and you can edit existing patterns, provided you have read/write privileges.

To view and edit a Repricing Pattern, follow these steps:

1. Navigate to the **Repricing Pattern Summary** page of the pattern you want to update.
2. Search for a pattern. For further information, see the [Searching for Rules](#) section.
3. Select the appropriate pattern and click **Edit** to open the pattern you want to update.
4. Update the Name or Description.
5. Click **Apply** or **Save**, depending on the pattern type.

14.4 Copying Repricing Pattern

You can copy patterns to avoid having to enter data multiple times. This saves time and effort and also reduces mistakes.

To copy a Repricing Pattern, follow these steps:

1. Navigate to the **Repricing Pattern Summary** page of the pattern you want to copy.
2. Search for a pattern.
For more information, see the [Searching for Rules](#) section.
3. Select the appropriate pattern and click **Copy** to duplicate the pattern.
4. Select a folder where you want to save the pattern copy.
5. Enter a unique name for the new pattern.
(Optional) Enter a brief description of the pattern.
6. Select the access type.
7. Click the **Save** button.

14.5 Deleting Repricing Pattern

You can delete patterns that are no longer required.



Note:

A pattern cannot be retrieved after deletion.

Restrictions on deleting patterns are:

- You cannot delete patterns if you have only Read privileges. Only users with read/write privileges and pattern owners can delete patterns.
- You cannot delete a pattern that has a dependency.

To delete a Repricing Pattern, follow these steps:

1. Navigate to the **Repricing Pattern Summary** page of the pattern you want to delete.

2. Search for a pattern.
For more information, see the [Searching for Rules](#) section.
3. Select the appropriate pattern and click **Delete**

15

Behavior Pattern Rule

The Behavior Pattern (BP) functionality works similarly to amortization types. The Behavior Pattern code is assigned at the detail instrument level, and these designations are evaluated by the cash flow engine (CFE) for calculations. However, Behavior Patterns are portfolio level property rather than instrument level. Generally, a bank processes aggregated data for non-maturing products. In this case, the Behavior Pattern is assigned effectively at the portfolio level. If you are using CFE with any other service, then data is required at the instrument level and BP is also assigned accordingly.

In this case, you must track the changes to Behavior Patterns and assign appropriate codes to affected instruments. Due to this, only one BP can be used by the CFE in the CFE processes for current business. If you want to model multiple types of BP under varying scenarios, then you can use a Behavior Pattern Rule.

The Behavior Pattern Rule UI allows you to group Behavior Pattern codes (behavioral assumptions) together in a set at the Product/Currency level which then can be rotated to select a value on a combination. You can select which behavior assumption pattern to use and the underlying Behavior Pattern in that set will affect the data on processing

This chapter describes the procedure for working with and managing the Behavior Pattern rules.

Topics

- Search Behavior Pattern Rule. For more information, see the [Searching for Rules](#) section.
- [Create Behavior Pattern Rule](#)
- View and Edit Behavior Pattern Rule. For more information, see the [View and Edit the Rule](#) section.
- Copy Behavior Pattern Rule. For more information, see the [Copy the Rule](#) section
- Delete Behavior Pattern Rule. For more information, see the [Delete the Rule](#) section

15.1 Create Behavior Pattern Rules

You create behavior pattern rules to capture the principal run-off behavior of product types that do not have contractual maturities.

To create a Behavior Pattern rule, follow these steps:

1. Click **Add** icon from the top of the **Behavior Pattern Rule Summary** Page.

Figure 15-1 Creating Behavior Pattern Rule

Behavior Pattern Rule Details

Name *

Description

Folder ALMSEG Access Type Read Only Read/Write

Select Product Hierarchy

Folder ALMSEG Product Hierarchy Default_Prod_Hier

Select Currency

Currency US Dollar

Assumption Browser Assumption List

Assumption Browser

Product	Method	Conditional Assumption	Status
<input type="checkbox"/> Total Rollup			
<input type="checkbox"/> Orphan Branch			

2. Complete standard steps for this procedure. For more information, see the Overview of Common Rule Management Tasks section.

 **Note:**

In addition to the standard steps for creating Rules, the procedure for creating a Behavior Pattern Rule involves one extra step. After Standard Step, you need to select a product hierarchy. For more information, see the Overview of Common Rule Management Tasks section. 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 Asset Liability Management provides you with the option to copy, in total or selectively, the product assumptions contained within ALM 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.

15.2 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 explicitly defined for a child take precedence over those at the parent level.

Prerequisites

Performing basic steps for creating or editing a Behavior Pattern rule

Procedure

From the Assumption Browser screen, select the product or products and the currency for which you want to define a Behavior Pattern or Patterns and select Add to launch the Behavior Pattern Details window.



Note:

Using the default currency to setup 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.

15.3 Defining a Behavior Pattern Rule: An Example

To create a Behavior Pattern rule, enter the following details in the Behavior Pattern Rule window:

1. From the Behavior Pattern Rule window, select the following.
 - Currency (US Dollar)
 - Name
 - Description
 - Folder
 - Access Type
2. From the **Assumption Browser**, select a product from the **Hierarchy Browser**. Select **Add** icon to open the **Assumption Details** page.
3. Select a pattern from the **Behavior Pattern Selector**. Here, the **Behavior Pattern** drop-down list shows the list of existing Behavior Patterns.

Figure 15-2 Behavior Pattern Rule

The screenshot shows a web-based form for defining a Behavior Pattern Rule. It is organized into four main sections, each with a dropdown arrow on the left:

- Behavior Pattern Rule Details:** Contains a 'Name' field with the value 'New' and a 'Description' field.
- Product and Currency Details:** Contains a 'Product' dropdown menu with 'Asset1' selected and a 'Currency' dropdown menu with 'US Dollar' selected.
- Behavior Pattern Selector:** Contains a 'Behavior Pattern' dropdown menu.

At the bottom right of the form, there are two buttons: 'Apply' and 'Cancel'.

 **Note:**

Only Non-Maturing Behavior Pattern types are available. For more information, see the User Defined Behavior Patterns.

For more information, see the User Defined Behavior Patterns section. You can select only one Behavior Pattern at a time.

4. Click **Apply**.

Time Buckets

This module describes the procedure for working with and managing the Time Bucket rules.

The Time Bucket rules allow users to create the time bucket definitions used for computing and out-putting aggregated cash flows. The 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. Time Buckets can be defined for the following types of ALM output:

- **Income Simulation**
Income Simulation Buckets allow you to specify the time 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.

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 Oracle ALM 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 ALM Deterministic Processes during ALM engine processing.

- **Interest Rate GAP**
Interest Rate GAP Buckets allow you to define Interest Rate (repricing) GAP buckets including a **catch all** bucket to move repricing gap output for Non Interest Rate Sensitive products. From this screen, you can also define Dynamic Start Dates (as of date is always the initial start date), which allows you to generate both static and dynamic GAP simulations.

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 the amortization of existing business and any new business assumptions that are applicable between the current as of date and the future dated – Dynamic Start Date. You must set up Income Simulation Buckets before defining Interest Rate GAP Buckets.

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**

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 Asset Liability Management business rules.

Topics

- [Creating Time Bucket Rules](#)
- [Defining Time Bucket Rules](#)

16.1 Creating Time Bucket Rules

You create Time Bucket rules to specify the time periods used for storing and reporting ALM results. To create a new Time Bucket rule, follow these steps:

1. Navigate to the **Time Buckets Summary** page.
2. Click **Add** to create a new Time Bucket rule.

Figure 16-1 Creating Time Bucket

The screenshot displays the Oracle ALM Maintenance > Time Buckets interface. At the top right, it shows 'As Of Date : 03/31/2022'. The main section is titled 'Time Bucket Details' and contains the following fields:

- Name**: A text input field.
- Description**: A larger text input area.
- Folder**: A dropdown menu currently set to 'ALMSEG'.
- Access Type**: Radio buttons for 'Read Only' and 'Read/Write' (selected).
- Active**: A checkbox.

Below the form are three tabs: 'Income Simulation Buckets', 'Interest Rate Gap Buckets', and 'Liquidity Buckets'. The 'Income Simulation Buckets' tab is active, showing a table with the following data:

Serial Number	Frequency	Multiplier	Start Date	End Date	Federal Tax Percentage	State Tax Percentage	Dividend Amount	Dividen
1	0	Months	04/01/2022	03/31/2022	0	0	0	

3. Enter the **Name** and **Description** of Time Bucket.
4. Select the **Folder** and **AccessType**.
5. Additional 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 enable **Activate** check box and save the Rule. You will note the Active Time Bucket rule for your user appears on the Title bar in green text.

For more information, see [Creating Rules](#).

6. Define the Time Bucket rule. For more information, see [Defining Time Bucket Rules](#)

16.2 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. You must define the Time Bucket assumptions before clicking **Save**.

In the **Time Bucket Details** screen, you have three tabs 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)

Prerequisites

Performing basic steps for creating or editing a Time Bucket rule. For more information, see the [Creating Time Bucket Rules](#).

To define the Time Bucket rule, follow these steps:

1. In the **Income Simulation** tab, follow these steps:

Figure 16-2 Income Simulation Buckets

Serial Number	Frequency	Multiplier	Start Date	End Date	Federal Tax Percentage	State Tax Percentage	Dividend Amount	Dividend
1	0	Months	04/01/2022	03/31/2022	0	0	0	

- a. Click **Add Rows** and enter the desired number of rows corresponding to the number of **Income Simulation Buckets** required to create. You can select a pre-defined number of rows from the list. For example, 3, 5, 10, or you can enter the exact number of rows required to add. The maximum number of buckets you have under any tab is 240.
- b. Under **Frequency**, enter 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.
- c. Under **Multiplier**, select an appropriate value from the list. The **Multiplier** column includes **Daily, Monthly, or Yearly** options.

 **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()
```

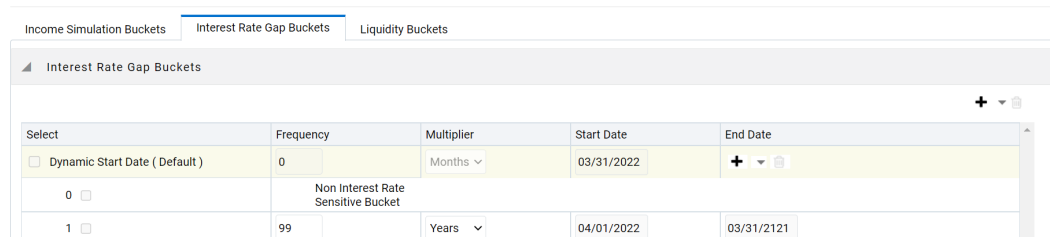
- d. Continue adding frequencies and multipliers as needed. After you fill in the frequencies and multipliers, the start and end dates are calculated automatically based on the **As of Date**, defined in your **Application Preference** settings. You may want to utilize the **Data Input Helper** to copy from a row where you have already defined the time bucket definition or apply a fixed value down the page. For more information, see the *Data Input Helper* section of OFSAA Rate Management.
- e. 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 ALM when processing with the **Autobalancing** is 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.
- f. Under **Dividend Amount**, type a value. Dividend amounts are used in HM when processing with the Autobalancing is selected. The values you enter here will be paid out as dividends for all rate scenarios.
- g. Under **Dividend Percentage**, type a value. Dividend percentages are used during Autobalancing 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.
$$\text{Total Dividends} = \text{Dividends Amount} + (\text{Dividends Percent} \times \text{Net Income after Tax})$$
- h. Select **Save** if you are finished.
- i. Otherwise, navigate to the **Interest Rate GAP Bucket** tab. After defining **Income Simulation buckets**, navigate to the **Interest Rate GAP Buckets** tab. This tab 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.

2. In the **Interest Rate GAP Buckets** tab, follow these steps:

Figure 16-3 Interest Rate GAP Buckets



Select	Frequency	Multiplier	Start Date	End Date
<input type="checkbox"/> Dynamic Start Date (Default)	0	Months ▾	03/31/2022	+ ▾ ⌵
0 <input type="checkbox"/>	Non Interest Rate Sensitive Bucket			
1 <input type="checkbox"/>	99	Years ▾	04/01/2022	03/31/2121

- a. Click **Add Rows** corresponding to the Default Dynamic Start Date and enter 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**.

The product dimension Attribute **Interest Rate Sensitivity Category** identifies products as **Interest Rate sensitive** or **Non Interest Rate sensitive**. Once a product is mapped as Non Interest Rate sensitive, you must enable **Include Non Interest Rate Sensitive Bucket** in Process Rules (see ALM Processing). This moves reprice gap output from Non Interest Rate Sensitive products into **Non Interest Rate Sensitive Bucket**

- b. Follow steps a— d described above under Income Simulation Buckets, to complete the setup of your Interest Rate GAP Buckets and Non Interest Rate Sensitive Bucket for the defaultDynamic Start Date.
- c. If you would like to define additional – forward dated, **Dynamic Start Dates**, Click **Add Dynamic Start Date** to add one or more parent nodes to the bucket hierarchy.
- d. For each additional **Dynamic Start Date** row, enter the Frequency and **Multiplier** to determine future start date(s).
- e. Click **Add Rows** corresponding to each new **Dynamic Start Date** and repeat the **InterestRate GAP Bucket** definition steps previously described to complete the setup.
- f. After defining **Interest Rate GAP Buckets**, navigate to the **Liquidity Buckets** tab. This tab has the same structure as the **Interest Rate GAP Buckets** tab. 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

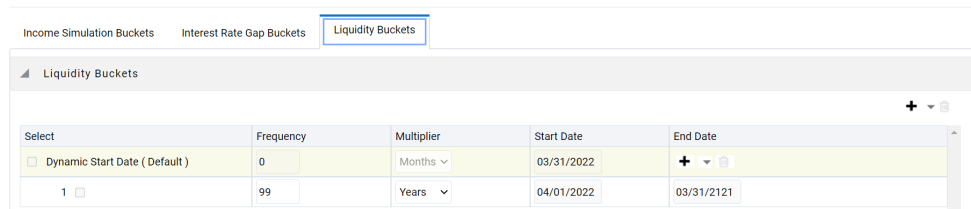
Dynamic Start Dates will allow you to forecast your liquidity position as of some future point in time, considering all relevant assumptions, including amortization, prepayments, early withdrawals, and rollovers.

 **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.

3. In the **Liquidity Buckets** tab, follow these steps:

Figure 16-4 Liquidity Buckets



Select	Frequency	Multiplier	Start Date	End Date
<input type="checkbox"/> Dynamic Start Date (Default)	0	Months ▾	03/31/2022	+ ▾
1 <input type="checkbox"/>	99	Years ▾	04/01/2022	03/31/2121

- a. Click **Add Rows** corresponding to the **Default Dynamic Start Date** and input the desired number of rows for your **LiquidityBuckets**.
- b. Follow steps b– d described under **Income Simulation Buckets**, to complete the setup of your Liquidity Buckets for the **Default Dynamic StartDate**.
- c. If you would like to define additional – forward dated, **Dynamic Start Dates**, Click **Add Dynamic Start Date** to add one or more parent nodes to the bucket hierarchy.
- d. If needed, enter the **Frequency** and **Multiplier** for the new **Dynamic Start Date** to determine the future start date.
- e. Click **Add Rows** corresponding to the new **Dynamic Start Date** and repeat the Liquidity GAP Bucket definition steps previously described.
- f. Click **Save** once you have completed the setup for all bucket types.

 **Note:**

Each time you change the As of Date in your **Application Preferences** window, all **Time Bucket Rule Buckets Start Date** and **Bucket End Date** updated automatically.

Excel Import/Export functionality is used for adding/editing time bucket information. For more information , see the section Excel Import/Export

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 predefine and save common product definitions and reference these definitions when defining the Product Characteristic assumptions. Setup Bond Adjustment Rate Product Profile - Attributes me is reduced because Product Profiles provide common default values for the required fields. The following Product Profiles are seeded during the 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 the setup by creating new profiles or making a copy using the **Save As** option with one of the existing profiles.

 **Note:**

The seeded Product Profiles are non-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:

Topics:

- Search Product Profiles. For more information, see the [Searching for Rules](#) section.
- [Creating Product Profiles](#)
- View and Edit Product Profiles. For more information, see the [View and Edit the Rule](#) section.
- Copy Product Profiles. For more information, see the [Copy the Rule](#) section
- Delete Product Profiles. For more information, see the [Delete the Rule](#) section

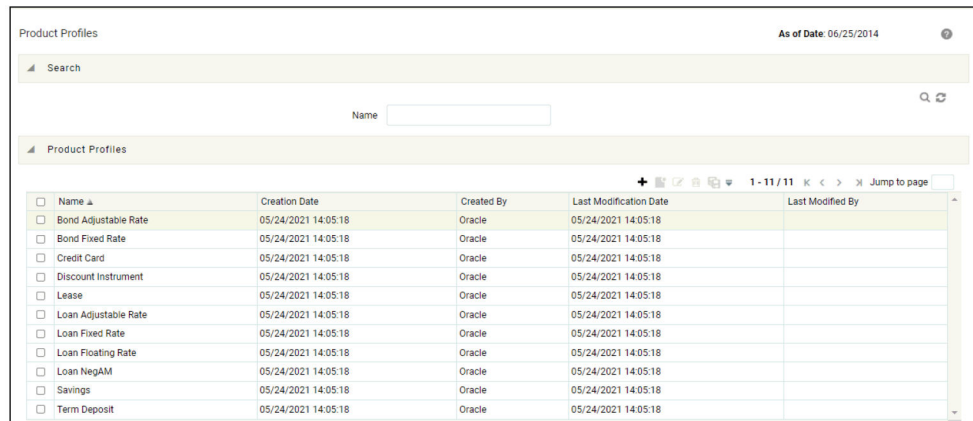
17.1 Viewing a Seeded Product Profile

You can review any of the twelve seeded Product Profile definitions.

To view the Product Profile, follow these steps:

1. Navigate to the **Product Profiles** summary page.

Figure 17-1 Product Profiles summary page



<input type="checkbox"/> Name	Creation Date	Created By	Last Modification Date	Last Modified By
<input type="checkbox"/> Bond Adjustable Rate	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Bond Fixed Rate	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Credit Card	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Discount Instrument	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Lease	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Loan Adjustable Rate	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Loan Fixed Rate	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Loan Floating Rate	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Loan NegAM	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Savings	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	
<input type="checkbox"/> Term Deposit	05/24/2021 14:05:18	Oracle	05/24/2021 14:05:18	

2. Select the check box next to the Product Profile and click **View**.
3. Navigate to the **All Business** and **New Business** tabs to review the seeded values.

17.2 Creating Product Profiles

Create Product Profiles to assign the default attributes for common products. Reference these Product Profiles within the Product Characteristic assumption rules to reduce the setup time. For more information, see the Product Characteristic section. In addition to the seeded Product Profile templates, you can also create new Product Profiles.

To create a new Product Profile, follow these steps:

1. Navigate to the **Product Profiles** summary page.
2. Complete standard steps for this procedure. For more information, see the Overview of Common Rule Management Tasks section.

Figure 17-2 Create Product Profiles

Product Profile Details			
Name *	New		
Description			
<input type="radio"/> All Business <input type="radio"/> New Business			
Model with Gross Rates	<input type="checkbox"/>	Interest Credited	<input type="checkbox"/>
Option Adjusted Spread	0.0 %	Percent Taxable	0.0 %
Currency Gain/Loss Basis	None	Pay Equivalent Compounding Convention	None
Holiday Calendar		Rolling Convention	Unadjusted
Interest Calculation Logic	<input checked="" type="radio"/> Shift Dates Only <input type="radio"/> Recalculate Payment		
<input type="button" value="Save"/> <input type="button" value="Cancel"/>			

3. Enter a Name and Description for the new Product Profile.
4. Define product attributes for the profile. For more information on individual attributes, see the Product Characteristics section.
5. Click **Save** to complete the new Product Profile definition.

17.3 Summary of Seeded Product Profiles

The following tables summarize the attributes defined for each Product Profile.

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Non-Amortizing	Amortization Type
From the New Business tab, select Define Core Product Attributes tab	Other Adjustable	Adjustable Type

Location	Default Value	Attribute
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	6 Months	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab	6 Months	Repricing Frequency
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Negative Amortization Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Bond Fixed Rate Product Profile - Attributes

Table 17-1 Bond Fixed Rate Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Non-Amortizing	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Fixed Rate	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	6 Months	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis

Table 17-1 (Cont.) Bond Fixed Rate Product Profile - Attributes

Location	Default Value	Attribute
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Credit Card Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention

Location	Default Value	Attribute
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Behavior Pattern	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Floating Rate	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score

Location	Default Value	Attribute
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Discount Instruments Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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

Location	Default Value	Attribute
All Business tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Non-Amortizing	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Fixed Rate	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	3.0%	Original Deferred Amortization %
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	90 Days	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / 360	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer

Location	Default Value	Attribute
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Lease	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Fixed Rate	Adjustable Type

Location	Default Value	Attribute
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / 360	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Loan Adjustment Rule Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Conventional Adjustable	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Other Adjustable	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis

Location	Default Value	Attribute
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab	1 Year	Repricing Frequency
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Loan Fixed Rate Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention

Location	Default Value	Attribute
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Conventional Fixed	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Fixed	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score

Location	Default Value	Attribute
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Loan Floating Rate Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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

Location	Default Value	Attribute
All Business tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Conventional Fixed	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Fixed	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>

Location	Default Value	Attribute
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Loan Negative Amortization Product Profile - Attributes

Location	Default Value	attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Adjustable Negative Amortization	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Other Adjustable	Adjustable Type

Location	Default Value	attribute
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab	1 Month	Repricing Frequency
From the New Business tab, select Define Neg Am Attributes tab	6 Months	Payment Change Frequency
From the New Business tab, select Define Neg Am Attributes tab	3 Months	Equalization Frequency
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Savings Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected.	Holiday Calendar
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Behavior Pattern	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Floating Rate	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis

Location	Default Value	Attribute
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value
New Business tab Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

Term Deposits Product Profile - Attributes

Location	Default Value	Attribute
All Business tab	100	Percent Taxable
All Business tab	Do Not Adjust	Pay Equivalent Compounding Convention
All Business tab	Blank, that is, the holiday calendar is not selected	Holiday Calendar

Location	Default Value	Attribute
All Business tab	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 tab	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
From the New Business tab, select the Define Core Product Attributes secondary tab	Non-Amortizing	Amortization Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Fixed Rate	Adjustable Type
From the New Business tab, select the Define Core Product Attributes secondary tab	Unchecked	Inflation Indexed Instrument
From the New Business tab, select Define Payment Attributes secondary tab	1 Month	Payment Frequency
From the New Business tab, select Define Payment Attributes secondary tab	Interest In Arrears	Interest Type
From the New Business tab, select Define Payment Attributes secondary tab	Actual / Actual	Accrual Basis
From the New Business tab, select Define Payment Attributes secondary tab	Simple	Compounding Basis
From the New Business tab, select Define Payment Attributes secondary tab	Floating Net Rate	Net Margin Flag
From the New Business tab, select Define Adjustable Rate Attributes tab		<Not Applicable>
From the New Business tab, select Define Other Mortgage Attributes tab	700	Customer Credit Score
From the New Business tab, select Define Other Mortgage Attributes tab	80	Original Loan to value

Location	Default Value	Attribute
From the New Business tab, select Define Other Mortgage Attributes tab	FANNIE_MAE	Issuer
From the New Business tab, select Define Neg Am Attributes tab		<Not Applicable>
From the New Business tab, select Define Inflation Adjustment Attributes tab	0	Index Name
From the New Business tab, select Define Inflation Adjustment Attributes tab	Principal and Interest payments both	Index Adjustment Type
From the New Business tab, select Define Inflation Adjustment Attributes tab	No Floor	No Floor Capital Protection Category



Note:

If the user is mapped to ADCo, the Product Profile will always show **Define Other Mortgages Attributes** tab.

18

Product Characteristics

Product Characteristic Rules are used to define payment, pricing, and repricing characteristics for new business. They are also used to specify general calculation attributes for both existing accounts and new business.

The procedure for working with and managing Product Characteristics is similar to that of other Asset Liability Management business Rules. It includes the following steps:

- Search Product Characteristic Rules. For more information, see the [Searching for Rules](#) section.
- [Creating Product Characteristic Rules](#)
- View and Edit Product Characteristic Rules. For more information, see the [View and Edit the Rule](#) section.
- Copy Product Characteristic Rules. For more information, see the [Copy the Rule](#) section
- Delete Product Characteristic Rules. For more information, see the [Delete the Rule](#) section

As part of creating and editing Product Characteristic Rules, you assign product attribute assumptions to applicable products from the product hierarchy.

Note:

Oracle Asset Liability Management provides the option to copy, in total or selectively, the product assumptions contained within ALM 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.

18.1 Creating Product Characteristic Rules

You create a Product Characteristics Rule to assign attributes to the products.

To create a Product Characteristic Rule, follow these steps:

1. Navigate to the **Product Characteristics** summary page.

Figure 18-1 Product Characteristics Summary Page

<input type="checkbox"/>	Name	Creation Date	Created By	Last Modification Date	Last Modified By	Access Type
<input type="checkbox"/>	Ejada_PC	09/29/2022 07:24:57	ALMADMIN	09/29/2022 07:26:28	ALMADMIN	Read/Write
<input type="checkbox"/>	Bug34393570_PC	07/21/2022 12:05:47	ALMADMIN	07/21/2022 12:06:05	ALMADMIN	Read/Write
<input type="checkbox"/>	Bug34350456_PC	07/20/2022 10:31:36	ALMADMIN	07/20/2022 10:31:40	ALMADMIN	Read/Write

2. Complete standard steps for this procedure. For more information, see the Overview of Common Rule Management Tasks.

Figure 18-2 Product Characteristics Window to Create a New Product Characteristics Rule



Note:

In addition to the standard steps for creating Rules, the procedure for creating Product Characteristics involves one extra step. After Standard Steps, you must 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.

18.2 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 in the products at this point. Start defining the Product Characteristic assumptions for product or 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 the chart of accounts to take advantage of the parent-child relationships defined for the various nodes of the product hierarchies when defining Rules. Children of parent nodes on a hierarchy automatically inherit the assumptions defined for the parent nodes. However, assumptions explicitly defined for a child take precedence over those at the parent level.

Prerequisites

Performing basic steps for creating or editing a Product Characteristics Rule.

To define a Product Characteristic Rule, follow these steps:

1. From the **Assumption Browser** window, select the product (or products) and the currency to define the Product Characteristics. Click **Add +** icon to launch the **Product Characteristic Details** window.
2. Select the **Currency**.

 **Note:**

To define assumptions for all currencies with the selected product, select **Default Currency**.

3. From the **Assumption Browser**, select the Product or Products.
4. Click the **Add Assumption**.
Enter a value for mandatory fields. Mandatory input fields are marked with a red asterisk.
Else, select one of the seeded **Product Profile** templates or a user-defined Product Profile to prepopulate the appropriate **Product Characteristic** fields.
5. From the **File** menu, select **Save**.

 **Note:**

Using the default currency to setup assumptions can save data input time. At runtime, 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 when using this option on UI where an Interest Rate Code is a required input. In most cases, you will want to use a 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.

6. The **Product Characteristic Details** window has the following three input tabs:
 - All Business

- New Business
- Model Integration



Note:

The **Model Integration** tab will be available only if Moody's structured cash flow library integration is done with ALM.

18.2.1 Using Assumptions

This section describes about using the assumptions.

Assumption Browser

From the **Assumption Browser** window, select the product (or products).

1. Select the **Add Assumption**.
2. Type a value for each mandatory field. Mandatory input fields are marked with a red asterisk.

You can optionally select one of the seeded Product Profile templates or a user-defined Product Profile to prepopulate the appropriate **Product Characteristic** fields.

Assumption List Tab

The **Assumption List** tab is present next to the **Assumption Browser** in all the windows which have the **Assumption Browser**. This tab provides the following five search 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, and 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 icon initiates the search on the **Assumption Browser** based on the filter criteria provided in the above-mentioned fields. **Reset** restores the 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.

18.2.2 All Business Tab

The 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.

Figure 18-3 All Businesses Tab of Product Characteristic to Define the Product Characteristic Rule

Table 18-1 Fields to define the attributes for All Businesses and their Descriptions

Fields	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 the value of less than 2.00% is recommended for the best results. For more information about the calculation of discount factors, see the Oracle Financial Services Cash Flow Engine ReferenceGuide .
Model with Gross Rates	If the institution has outsourced loan serving rights for some of the assets (most typically mortgages), the rates paid by customers on those assets (gross rates) will be greater than the rates received by the 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.
Interest Credited	This option allows interest payments to be capitalized as principal on simple or non-amortizing instruments.

Table 18-1 (Cont.) Fields to define the attributes for All Businesses and their Descriptions

Fields	Behavior
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 must be set up for each product and reporting currency or product and default currency combination.
Currency Gain or Loss Basis	Currency Gain or 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 For more information on the cash flow calculations associated with currency gain or loss recognition techniques, see the Oracle Financial Services Cash Flow Engine Reference Guide.
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 must be set to Semi-Annual Quoting Convention. For other accounts, the convention must 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 window.

Table 18-1 (Cont.) Fields to define the attributes for All Businesses and their Descriptions

Fields	Behavior
Rolling Convention	<p>The default value is Unadjusted and is Enabled, only when Holiday Calendar is selected in the preceding field. This drop-down list contains the following values:</p> <p>Actual or Un-adjusted Payment on an actual day, even if it is a non-business day.</p> <p>Following business day The payment date is rolled to the next business day.</p> <p>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.</p> <p>Previous business day The payment date is rolled to the previous business day.</p> <p>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.</p> <p>*Many institutions have month-end accounting procedures that necessitate this.</p>
Interest Calculation Logic	<p>There are two options:</p> <p>Shift Dates Only</p> <p>Recalculate Payment</p>



Note:

The Holiday Calendar attributes can be applied directly to the instrument records for an existing business. If they are not applied to the records, the engine will use the definition from the **All Business** tab to apply **Holiday Calendar** for existing and New Business.

18.2.3 New Business Tab

The 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 the forecast instruments.

Figure 18-4 New Businesses Tab of Product Characteristic to Define the Product Characteristic Rule

The screenshot shows the 'New Business' tab with the following fields and values:

Core Products Attributes			
Amortization Type *	None	Behavior Pattern Code	
		Payment Pattern Code	
Adjustable Type *	None	Repricing Pattern Code	
Lease Residual Value	0 %	Interest Rate Code *	[USD] 801_IRC (801)
Amortization Method for Premiums, Discounts, Costs and Fees	Level Yield	Original Deferred Amortization Percent	0 %
Inflation Indexed Instrument	<input type="checkbox"/>		

The following secondary tabs are available in New Business tab:

- 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 OFS ALM is 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.

Relationship Triggers

There are dependencies built into the tabular structure of this window. Based on the assumptions made in the first two tabs, the remaining two tabs may not be active.

Table 18-2 Relationship Triggers of All Businesses and New Businesses

Field	Value	Behavior
Amortization Type Code	Conv. Fixed, Conv Adjust., Adjst/Ng Amrt	Always interest in arrears, therefore, disables Interest Type.

Table 18-2 (Cont.) Relationship Triggers of All Businesses and New Businesses

Field	Value	Behavior
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-down list.
Amortization Type Code	Behavior Pattern	Enables the Behavior Pattern drop-down list.
Amortization Type Code	Conv Fixed, Conv Adjust., Level Principal, Non-Amortizing	The Inflation Indexed Instrument check box will be selected.
Adjustable Type Code	Other Adjustable, Fixed Rate, Floating Rate, or Repricing pattern	Repricing Frequency is inapplicable, or it is defined elsewhere, therefore disables Repricing Frequency and Multiplier. Enables the Adjustable Rate Attributes tab. When 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-down list. Also, the repricing attributes that are defined elsewhere are disabled in this Rule. Only periodic increase and decrease, rate change rounding are enabled.

Table 18-2 (Cont.) Relationship Triggers of All Businesses and New Businesses

Field	Value	Behavior
Repricing Frequency	"0"	No repricing occurs and therefore disables the Adjustable Rate Attributes tab.
Model with Gross Rates	Off	Net Margin Flag options are only necessary when modeling with different gross rates and net rates, and therefore disables Net Margin Flag.
Rate Change Rounding Type	"No Rounding" or "Truncate"	Rounding does not apply, and 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.

18.2.3.1 Core Product Attributes Secondary Tab

The following is a listing of new business fields used in the **Define Core Products Attributes** secondary tab of the Product Characteristics Rule.

Figure 18-5 Define Core Products Attributes Tab to Define the Product Characteristic Rule

All Business		New Business			
Define Core Products Attributes		Define Payment Attributes		Define Adjustable Rate Attributes	
Core Products Attributes					
Amortization Type *	None	Behavior Pattern Code			
		Payment Pattern Code			
Adjustable Type *	None	Repricing Pattern Code			
Lease Residual Value	0 %	Interest Rate Code *	[USD] 801_IRC (801)		
Amortization Method for Premiums, Discounts, Costs and Fees	Level Yield	Original Deferred Amortization Percent	0 %		
Inflation Indexed Instrument	<input type="checkbox"/>				
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>					

Table 18-3 Fields to add the core product attributes for New Businesses and their 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 follows: 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 the 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.
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 that 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 expressed as a percent of original par balance.

Table 18-3 (Cont.) Fields to add the core product attributes for New Businesses and their Descriptions

Field	Description
Inflation Indexed Instrument	Select this check box to enable the Inflation Indexed tab.

18.2.3.2 Payment Attributes Secondary Tab

The following is a listing of new business fields used in the **Define Payment Attributes** secondary tab of the Product Characteristics Rule.

Figure 18-6 Define Payment Attributes Tab to Define the Product Characteristic Rule

Table 18-4 Fields to add the payment attributes for New Businesses and their Descriptions

Field	Description
Payment Frequency	Frequency of payment (P & I), Interest or Principal). For bullet instruments, use zero.
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.

Table 18-4 (Cont.) Fields to add the payment attributes for New Businesses and their Descriptions

Field	Description
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 as follows: 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 **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 or weekend date.

18.2.3.3 Adjustable Rate Attributes Secondary Tab

The following is a listing of new business fields used in the **Define Adjustable Rate Attributes** secondary tab of the Product Characteristics Rule.

Figure 18-7 Define Adjustable Rate Attributes Tab to define the Product Characteristic Rule

Adjustable Rate Attributes					
Repricing Frequency and Multiplier	0	Months	Rate Increase Period	0	%
Tease Period	0	Months	Rate Decrease Period	0	%
Tease Discount	0	%	Minimum Rate Change	0	%
Total :	0	%	First Reset Floor	0	%
Rate Cap Life	0	%	Rate Floor Life	0	%
Rate Set Lag	0	Months	Rate Increase Life	0	%
Rate Change Rounding Factor	0	%	Rate Decrease Life	0	%
Rate Change Rounding Type	No Rounding				

Table 18-5 Fields to add the Adjustable Rate attributes for New Businesses and their Descriptions

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 than the tease discount.
First Reset Cap	<p>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 value is defined for First Reset Cap.</p> <p>For example:</p> <p>Current Rate = 3.5% (from the instrument record)</p> <p>Margin = 0.3 %</p> <p>First Reset Cap = 0.5% (from the instrument record)</p> <p>First Reset Floor = 0.1% (from the instrument record)</p> <p>Scenario 1: If New Forecasted Rate = 5.1% (Forecast Rates Assumption)</p> <p>The 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%</p>

Table 18-5 (Cont.) Fields to add the Adjustable Rate attributes for New Businesses and their Descriptions

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 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: <ul style="list-style-type: none"> • 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	The 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.

18.2.3.4 Negative Amortization Attributes Secondary Tab

The following is a listing of new business fields used in the **Define Negative Amortization Attributes** secondary tab of the Product Characteristics Rule:

Figure 18-8 Define Negative Amortization Attributes secondary tab to define the Product Characteristic Rule

Table 18-6 Fields to add the negative amortization attributes for New Businesses and their 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 necessary to fully amortize the instrument is recalculated.
Payment Decrease Life	The maximum payment decrease allowed during the life of a negative amortization instrument.
Payment Decrease Period	The maximum payment decrease allowed during a payment change cycle of a negative amortization instrument.
Equalization Limit	The maximum negative amortization allowed, as a percent of the original balance, that is, if principal balance must never exceed 125% of the original balance, this column would equal value 125.0.
Payment Increase Life	The maximum payment increase allowed during the life of a negative amortization instrument.
Payment Increase Period	The maximum payment increase allowed during a payment change cycle on a negative amortization instrument.

18.2.3.5 Define Other Mortgage Attributes Secondary Tab

The following is a listing of new business fields used in the **Define Other Mortgage Attributes** secondary tab of the Product Characteristics Rule:

Table 18-7 Fields to add the other mortgage attributes for New Businesses and their Descriptions

Field	Description
Customer Credit Score	The default value of this is 700 and it must 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 .

Table 18-7 (Cont.) Fields to add the other mortgage attributes for New Businesses and their Descriptions

Field	Description
Original Loan To Value	The default value of this is 80 and it must 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.

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**.

18.2.3.6 The Model Integration Secondary Tab

This tab allows you to make the assumptions based on Moody's structured cash flow library integration for **All Business** and **New business** balances.

This tab will be displayed only if you have installed Moody's structured cash flow library. Following are the prerequisites to view the **Model Tuning** secondary tab:

- Moody's structured cash flow library installed on the setup
- Moody's structured cash flow 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. The following modeling options are available in the **Model Selection** drop-down list:

- None
- Source System Provided
- ADCo

Based on the selected model, the parameters will vary.

Figure 8: Define Model Integration secondary tab to define the Product Characteristic Rule

Table 18-8 Fields of Source System Provided tab and their Descriptions

Field	Behavior
Prepayments	This is the magnitude of the prepayment rate. The default value of this is 1, and it must be greater than 0.
Default	This is the magnitude of the default rate. The default value of this is 1, and it must be greater than 0.

Table 18-8 (Cont.) Fields of Source System Provided tab and their Descriptions

Field	Behavior
Recovery	This is the magnitude of the recovery rate. The default value of this is 1, and it must 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 of mortgage Draw rates. The default value of this is 1, and it must be greater than 0.

Enter values in these parameters if you want to use ADCo LDM integration along with Moody's Structured Cash flow library.

Table 18-9 Fields of ADCo tab and their Descriptions

Field	Behavior
SMM for Failed Loans	This is the failed loan's SMM in percentage. The default value of this is 0 and it must 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 must 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 must be in the range of 0-100.
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 must 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 must be in the range of 300-850.

18.2.3.7 Define Inflation Adjustment Attributes Secondary Tab

When the **Inflation Indexed Instrument** check box is selected on the **Define Core Product Attributes** secondary tab, the Define Inflation Adjustment Attributes secondary tab is enabled. For more information on Inflation Indexed Instrument calculation, see the [Oracle Financial Services Cash Flow Engine Reference Guide](#).

NOTE:



Note:

The **Define Inflation Adjustment Attributes** secondary tab will be enabled if the **Adjustment Type** is selected as **Conventional Adjust**, **Conventional Fixed**, **Level principal**, or **Non-Amortizing**.

Figure 18-9 Define Inflation Adjustment Attributes secondary tab to define the Product Characteristic Rule

Table 18-10 Fields to add the Index Adjustment attributes for New Businesses and their Descriptions

Field	Behavior
Index Name	Lists all Economic Indicator defined through the user interface.
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. Floor of 1: Floor of 1 protects the downside movement. Max during Life: Max during life gives maximum advantage using maximum Index factor for calculation.
Index Adjustment Type	Determines the type of Index Adjustment. The choices are: Principal and Interest Principal Only Interest Only



Note:

For more information on cash flow calculations associated with Inflation Indexed Instrument, see the [Oracle Financial Services Cash Flow Engine Reference Guide](#) .

18.3 Copying Assumptions Across Currencies and Products

This functionality provides the option to copy, in total or selectively, the product assumptions contained within the ALM 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 Asset Liability Management in a multi-currency environment. For example, if you have 10 currencies enabled in the application and you must input only one set of assumptions, 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 must audit inputs for a 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 IRCs 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.

Prerequisite

- Define ALM Rule related product assumptions. See:
 - Overview of Product Characteristic Rules
 - Overview of Discount Method Rules
 - Overview of Prepayment Rules
 - Creating a Forecast Balance Rule
 - Overview of Maturity Mix Rules
 - Overview of Pricing Margin Rules
 - Overview of Transfer Pricing Rules
 - Overview of Adjustment Rules

To copy the assumptions across Currencies and Products, follow these steps:

1. Navigate to the appropriate ALM 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 **Copy Across**.

Figure 18-10 Copy Across

Product	Status
<input type="checkbox"/> Total Rollup	
<input type="checkbox"/> Asset1	
<input type="checkbox"/> Liability1	
<input type="checkbox"/> Liability_TD_Prod1_NonRateSensitive	
<input type="checkbox"/> Liability_TD_Prod1_RateSensitive	
<input checked="" type="checkbox"/> Ejada_Casa_Prod_1	Defined
<input type="checkbox"/> Ejada_Casa_Prod_2	Defined
<input type="checkbox"/> Ejada_Casa_Prod_3	Defined

On the **Copy Across Details** page, select the listed currencies either individually using the corresponding check boxes or in total using **Select All**.

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.

- While defining a Rule if the Interest Rate Code is required, then **Copy Across (currency)** window will have an option to select the Interest Rate Code. For example, **Product Characteristic, Discount Methods, Prepayments, Transfer Pricing Rules, and Adjustment Rules** windows, the **Copy Across (Currency)** window will have an option for IRC selection.
- While defining a Rule if the Interest Rate Code selection is not required, then **Copy Across (Currency)** window will have the Interest Rate Code selection option disabled. For example, **Forecast Balances, Maturity Mix, and Pricing Margin** windows, the **Copy Across (Currency)** window will not have an option for IRC selection.
- If a Rule does not require the Interest Rate Code selection and RDP selection is required (for, **Forecast Balances, Maturity Mix, and Pricing Margin**), then **Copy Across (Currency)** will not have an option to select the IRC.

Figure 18-11 Copy Across (Currency)

Copy Across Options Currency ▾

Currencies		
<input type="checkbox"/>	Currency Name	Interest Rate Code
<input type="checkbox"/>	Canadian Dollar	▾
<input checked="" type="checkbox"/>	Indian Rupee	[INR] SR 3-30102448811_INR (803) ▾
<input type="checkbox"/>	US Dollar	[USD] 801_IRC (801) ▾

Apply Cancel

6. Click **Apply** to initiate the copy process and to return to the **Assumption Browser** page.
7. Review the results of the copy process from the **Assumption Browser** window 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 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** window to save the assumptions to the database.

Forecast Rates

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, repricing existing business, calculating prepayments, and determining discount methods. Use Economic Indicator forecasts to include in behavioral modeling and scenario or 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. For information on how to define Interest Rates, Economic Indicators, and Currency Exchange Rates, see the OFSAA Rate Management section.

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.

Topics:

- [Creating a Forecast Rates Assumption Rule](#)
- [Currency Forecast Methods](#)
- [Economic Indicator Forecast Methods](#)
- [Interest Rate Forecast Methods](#)
- [ALM Volatility Codes](#)
- [Behavior Pattern Rule Mapping](#)
- [Data Loader Procedure](#)

19.1 Creating Forecast Rate Rule

1. From the **Forecast Rates Summary** page, click **Add**.
2. Enter a name for the rule.
3. Enter a description for the rule. This is an optional field.
4. Select the **Reporting Currency**.
5. Select a **Folder**.
6. Select the **Access Type** option.
7. Click **Save**.

The **Apply defined method to all IRCs** check box is only supported for flat rates method. Other IRC methods do not support Apply to all.

Features of Forecast Rates

The selected reporting currency that you created appears in the Forecast Rates assumption rule window. Each Forecast Rate 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 less than 2%, then set the minimum rate to the floor at 0%, although negative rates are allowed if required.

The following options are available for defining Forecast Rate Scenario:

- Standardized Approach
- Enhanced Approach

IRRBB Standardized Approach Shocks allows you to select one of the six Standardized Approach Shocks (SAS) in a forecast rate scenario for certain currency IRCs. The following are the 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 are available for supported currencies. If an IRC is for a non-supported currency, then these options will not display.

For more information, see the [Cash Flow Engine ReferenceGuide](#).

The Active currencies defined under the **Currencies** section of the **Rate Management** are listed under the **Currency Codes** pane. 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** pane is dependent on the selected currency. The IRCs, including a reference IRC for each currency, are loaded from the **Rate Management**. When you select a currency other than the reporting currency, the options under **Currency Forecast Method** pane provide several ways to model relationships between the Exchange Rates and Interest Rates.

The Economic Indicators for all active indices are listed in the **Economic Indicator** section. These indices are not dependent on the currency selected. Use these indicators to set up scenarios around changing the economic conditions that will affect the forecast outcome of another variable. For example, if you forecast a higher GDP, then use 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 the **Rate Management**.

The IRCs for all active currencies (and reporting currencies, a subset of the active currencies) are listed under the Interest Rate Codes. The options under the **Interest Rate Code Forecast method** pane provide several ways to model the effects on portfolio cash flows due to interest rate changes.

You can map your forecast scenario with the Behavior Pattern Rule. For more information, see the Behavior Pattern Rule Mapping section.

19.2 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.

Table 19-1 Currency Forecast Methods

Method	Description
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 the Rate Management.

You can map your forecast scenario with Behavior Pattern Rule. For more information, see the Behavior Pattern Rule Mapping section.

Examples of Currency Forecasting

The following examples use the 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

For all the examples, start with the following:

1. Create a new Forecast Rates Assumption Rule with USD as the Reporting Currency.
2. In the **Forecast Rates** window, add a scenario:
 - a. Click **Add**.
 - b. Type a **Name** for the scenario.
3. 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, follow these steps:

1. From **Currency Codes**, select **AUD: Australian Dollar**
2. From **Currency Forecast Method**, click **Flat**.

3. Click **View**.
Under **Rate Value**, see the exchange rate: \$1.108 AUD s equal \$1 USD. This rate is applied uniformly to all date buckets, based on the rate in effect at the As Of Date in the **Application Preferences**.
4. Click **OK**.
5. Click **Save** in **Forecast Rates** window.

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, follow these steps:

1. From **Currency Codes**, select **AUD: Australian Dollar**.
2. From **Currency Forecast Method**, select **Structured Change**.
3. Click **Define**.
4. Add rows using **Add** and enter bucket numbers and rate changes.
5. Use the **Excel Import or Export** feature to add the rate changes. For more information, see the Excel Import or Export section.
6. Click **Apply**.
7. Click **View** to see the output table.
8. After viewing the **Currency Codes** in **Currency Codes Structured Change** window, click **OK**.
9. Click **Save** in **Forecast Rates** window.

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, follow these steps:

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.
6. Use the **Excel Import or Export** feature to add the rate values. For more information, see the Excel Import or Export section.
7. After viewing the Currency Codes in **Currency Codes Structured Change** window, click **OK**.
8. Click **Save** in **Forecast Rates** window.

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**. Enter interest rate changes for 02/01/2010 through 04/30/2010 in **Currency Codes Structured Change** window.
6. Click **Apply**.
7. In the **Forecast Rates** window, forecast changes in the Australian dollar reference interest rate.
8. From **Currency Codes**, select **AUD: Australian Dollar**
9. From **Interest Rate Codes**, select **IRC AUD**.
10. From **Rate Forecast Method**, select **Direct Input**
11. Click **Define**. Enter interest rate changes for 02/01/2010 through 04/30/2010 in **Currency Codes Structured Change** window.
12. Click **Apply**.
13. Click **Save** in **Forecast Rates** window.

The **View** option is not available for the parity feature. To view the results, enable the **Forecast Rate** option in the **Audit** block of **ALM process** window for the relevant interest rate codes. Audit results are 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. This forecast is based on the historical interest rates from the reference IRC of each currency. This example assumes that the following reference IRCs are assigned in Rate Management:

- U. S. dollar: Treasury Index
- Australian dollar: IRC AUD

In the **Forecast Rates ID** window, follow these steps:

1. From **Currency Codes**, select **AUD: Australian Dollar**
2. From **Currency Forecast Method**, select **No Arbitrage**.
3. Click **Save**.

The **View** button is not available for the **No Arbitrage** feature. To view the results, enable the **Forecast Rate** option in the **Audit** block of the **ALM Process** window for the relevant Interest Rate Codes. Audit results are written to the FSI_INTEREST_RATES_AUDIT table.

19.3 Economic Indicator Forecast Methods

The following Economic Indicator methods are available.

Table 19-2 Economic Indicator Forecast Methods

Method	Description
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

Flat: Viewing an economic index forecasted for New Residential Sales.

1. From **Currency Codes**, select **USD: US Dollar**.
2. From **Economic Indicators**, select **New Residential Sales**.
3. From **Economic Indicator Forecast Method**, select **Flat**
4. Click **View**.

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** window.

Structured Change: Model a gradual increase for six months in New Residential Sales.

1. From **Currency Codes**, select **USD: US Dollar**.
2. From **Economic Indicators**, select **New Residential Sales**.
3. From **Economic Indicator Forecast Method**, select **Structured Change**.
4. Click **Define**. Enter the interest rate change.
5. Click **Apply** in the **Economic Indicator View Structured Changes** window
6. Click **View** in the **Forecast Rates** window
7. You can see the incremental increase over the six months ($150 = 25 \text{ per month} * 6 \text{ months}$)

Direct Input: To use the Direct Input method, see the Structured Change section with the following steps:

1. From **Currency Codes**, select **USD: US Dollar**.
2. From **Economic Indicators**, select **New Residential Sales**
3. From **Economic Indicator Forecast Method**, select **Direct Input**.
4. Click **Define**. Enter the interest rate change. Enter New Residential Sales data (forecasted values for each bucket rather than forecasted values changes over a period of one or more buckets).

After defining the forecast method for an Economic Indicator, you can undo the definition by selecting the relevant Economic Indicator (green color check-box) and click **Un-Define**. This will bring the Economic Indicator to its original undefined state indicated by the Red Color check box. Use this if you want to delete an Economic Indicator from the Economic Indicator of the Rate Management after defining the forecast method for it.

19.4 Interest Rate Forecast Methods

The following Interest Rate Forecast methods are available.

Table 19-3 Interest Rate Forecast Methods

Method	Description
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.

Table 19-4 Interpolation Methods

Method	Description
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.

Table 19-4 (Cont.) Interpolation Methods

Method	Description
Cubic Spline of Yields	<p>A cubic spline is a series of third-degree polynomials that have the form:</p> $y = a + bx + cx^2 + dx^3$ <p>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.</p> <p>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 ($y'=0$).</p>
Quartic Spline	<p>Quartic interpolation requires a minimum of 4 knot points. The quartic interpolation equation can be represented as:</p> $Y = a + b X^1 + c X^2 + d X^3 + e X^4$ <p>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 $5*(n-1) \times 5*(n-1)$. The matrix is formed according to the following logic:</p> <p>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.</p>

In looking up the 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 an interpolation to determine the implied three-month rate. The **Interpolation** method used is defined by the selected interpolation method for the Interest Rate Curve.

Note

You must supply the input data for all term points of an IRC. This applies to historical rate and direct input forecast method. If data of one or more terms points is not given, then it can lead to errors during calculation.

Examples of Interest Rate Forecasting

You can generate the forecast rates for 360 calendar months, Moody's structured cashflow library's integration is done with ALM. 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 (First is 2 Yr, 10 Yr IRC and 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 (or points) are unavailable, then the engine will be unable to send the forecast rates for the IRC.

The engine will match the last day of the calendar month with the income simulation bucket (ISB) 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 must be extended till the 360th month. For example, if the ISB covers only 240 months, then the 240th month rate will be applied from the 241st to 360th months.

When **Show 360 months Buckets** check box is enabled, 2-year (24 months) and 10-year (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: Viewing U. S. dollar interest rates forecasted for the Treasury Index.

1. From **Currency Codes**, select **USD: US Dollar**.
2. From **Interest Rate Codes**, select **US Treasury Curve**.
3. From **Rate Forecast Method**, select **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 **Show 360 Months Buckets** check box is not selected by default. On selecting this check box, the results will be displayed for the 360 months view. You can not enter the values against buckets for Flat method in 360 months or ISB view. The **Show 360 Months Buckets** check box is available by default if the ADCo LDM, Moody's structured cashflow library, or both functions are mapped to you.

Structured Change: Model a gradual increase for six months in U. S. dollar interest rates.

1. From **Currency Codes**, select **USD: US Dollar**.
2. From **Interest Rate Codes**, select **US Treasury Curve**.
3. From **Rate Forecast Method**, select **Structured Change**.
4. Select the **Interpolation** method.
5. 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.
6. Enter the Interest Rate changes.
Use the **Excel Import or Export** feature to add the interest rate changes. For more information, see the Excel Import or Export section.

7. Click **Apply**.
8. Click **View** in **Forecast Rates** window.
After clicking **View**, the **Interest Rate View** window displays the rates forecasted for the Treasury Index in the ISB view. Here, Show Rates for **Show 360 Months Buckets** check box is not selected by default. On selecting this check box, the results will be displayed for the 360 months view. You cannot enter the values against buckets for Flat method in 360 months or ISB view. The **Show 360 Months Buckets** check box is available by default if the ADCo LDM, Moody's structured cashflow library, or both functions are mapped to you.
9. The rate increases you entered 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 19-5 Example of Structured Change

3 month	6 month	1 year	2 year
$1/6 \text{ of } 1.00 = 0.1667$	$1/6 \text{ of } 1.25 = 0.2083$	$1/6 \text{ of } 1.50 = 0.25$	$1/6 \text{ of } 1.75 = 0.2917$

10. The interest rates in buckets 2-7 reflects the increases.

Direct Input: To use the Direct Input method, see the Structured Change sections with the following modifications:

1. In step 5, enter Interest Rates (forecasted rates for each bucket rather than forecasted rate changes over a period of one or more buckets).
2. In step 3, select **Direct Input**.
3. During defining the Direct Input, **Show 360 Months Buckets** check box is selected by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to you. If you enter the forecast rates against 360 months, the UI converts the same across the Income Simulation Buckets.
4. Similarly, you can enter the data for income simulation buckets after unchecking the **Show 360 Months Buckets**. Now, the UI converts the rates from ISB to 360 months view.

When you switch from the 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?* . Click **YES** to erase the definition.

- Enter the data across ISB and select the **Show 360 Months Buckets** check box, it overrides that data for a few of the 360 months buckets.
- Enter the data across 360 months buckets and do not select the **Show 360 Months Buckets** check box, it overrides 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 360 months view. Here, the **Show 360 Months Buckets** check box is selected by default.

If you have defined the rates in the ISB and click **View**, the **Interest Rate View** window displays the result in the ISB view. Here, the **Show 360 Months Buckets** check box is disabled by default. On selecting this check 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.

Use the **Excel Import or Export** feature to add the interest rates. For more information, see the Excel Import or Export section.

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 change is required to the base curve, leave at 0.0, and click **Apply**.
Use the **Excel Import or Export** feature to add the absolute or percent rate changes. For more information, see the Excel Import or Export section.
5. 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 Show360 Months Buckets** check box is disabled by default. On selecting this check 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** check box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to you.

Change from Base: Select a Forecast Rate 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 a 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 selecting this check 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** check box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to you.

Yield Curve Twist: Setting 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**, select **Yield Curve Twist**.
4. Click **Define**.
 5. Enter the interest rate changes (flattening the curve around the three-month term point).
5. Click **Apply**.

After clicking **View**, the **Interest Rate View** window displays the results in the ISB view. Here, **Show Rates for Show 360 Months Buckets** check box is disabled by default. On selecting this check 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** check box is available by default if the ADCo LDM, or Moody's structured cashflow library, or both functions are mapped to you.

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** option. This will bring the Interest Rate Code to its original undefined state

indicated by **Red Color** check box. This step is necessary if you want to delete an Interest Rate Code from the **Interest Rates** window of the **Rate Management** window after defining the Forecast method for it.

Standardized Approach Shocks

Note:

Standardized Approach shocks are different than other Interest Rate Rules as these are applied at the scenario level instead of at the IRC level. When you create a new Forecast Rates rule, the default Scenario 1 is always the base scenario for Standardized Approach purposes and cannot have a **Standardized Approach shock** definition.

1. In **Forecast Rates** window, select the **IRRBB Shocks**. This allows you to define either **Standardized** or **Enhanced Approach** Scenarios, or both for a single Forecast Rates Rule. Once a forecast rates rule is 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**.
3. In the **Add Forecast Rates Scenario** window, select the **Scenario Type** to apply the scenario.
4. Only one Standardized Approach shock can 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 cannot be changed except for their interpolation method and minimum rate.
5. Click **Apply** to make scenario as Standardized Approach shock.

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. In the **Forecast Rates** window, select the **IRRBB Shocks**. This allows you to define either **Standardized** or **Enhanced Approach** scenarios, or both for a single Forecast Rate rule. After a Forecast Rate rule is 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**.
3. Only one Enhanced Approach shock can be applied to a single scenario, and no two EA shocks of the same type can be applied to the same Forecast Rates rule. All IRCs in this scenario remain fully editable for the Forecast method, Interpolation method, and Minimum Rate.
4. Click **Apply** to make the scenario as Enhanced Approach shock.

19.5 ALM Volatility Codes

This feature allows you to set a static shock percentage (positive or negative) to be applied to ALM Volatilities in a **Forecast Rates** window.

For more information, see the [Cash Flow Engine ReferenceGuide](#).

This pane displays the list of Interest Rate Codes that are defined as ALM Volatility Surface. To view or edit an ALM Volatility, following are the prerequisites:

- Interest Rate as an ALM Volatility Surface.
- Have a matching currency to the Forecast Rates Reporting Currency

For more information, see the Interest Rates Details section.

Following is an example to define the Shock Percentage for ALM Volatility Surface. These steps can be repeated for each new scenario.

1. From **Currency Codes**, select a **Currency**, for example, **USD: US Dollar**. Only ALM Volatility Surfaces of the same currency will be available.
2. In the **ALM Volatility** block, select a **Vol Surface**.
3. Enter shock percentage for respective ALM 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 an **ALM Volatility**, and then click **View**.
6. To remove the shock percentage, click **Un-Define**.

19.6 Behavior Pattern Rule Mapping

The **Behavior Pattern Rule Mapping** drop-down list shows the list of existing Behavior Pattern Rule. Select any behavior pattern to map with the current forecast scenario. To map a behavior pattern to all the forecast scenarios, use the **Apply to all scenarios** check box. For more information about the Behavior Pattern Rule, see the Behavior Pattern Rule section.

19.7 Editing a Forecast Rate

To edit a Forecast rate, follow these steps:

1. From **Currency Codes**, select the **Currency Code** (for example, **IND: INDS**).
2. Here, initially the IRC is in Red color and after selection (that is, Editing of Currency Code) and clicking **Apply**, it turns to Green color.
3. Selecting a different IRC means the addition of an IRC and not the deletion or Deselection of the rest of the IRCs. After reopening the Forecast Rate, the lowest IRC code will be selected by default. If the scenario is defined as a **Standardized Approach** scenario, then this definition can be changed or removed.
4. Select the **Edit** for a **Standardized Approach** scenario.
5. To change the scenario from one SA shock to another SA shock, select the new definition. Do this to change all the qualifying SA IRCs to the new definition.

6. To remove a SA definition to the current scenario, select the **Scenario Type** as **NONE**. This will remove all Forecast Method definitions for all qualified SA IRCs.
7. To change the SA definition to an Enhanced Approach definition, select an available **Enhanced Approach** scenario type. This will remove all Forecast Method definitions for all qualified SA IRCs.
8. Click **Apply**.

If the scenario is defined as an **Enhanced Approach** scenario, this definition can be changed or removed.

1. Select the **Edit** for an **Enhanced Approach** scenario.
2. To change the scenario from one EA shock to another EA shock, select the new definition. Changing from one EA scenario to another EA scenario will not change the IRC Forecast Methods already defined.
3. To remove an Enhanced Approach definition to the current scenario, uncheck the check box **IRRBB Standardized Rate Shocks**. Changing from an **EA Scenario** type to **NONE** will not change the currently defined IRC Forecast Methods.
4. To change an existing Enhanced Approach definition to a Standardized Approach scenario, select a currently available Standardized Approach type in the **Scenario Type** drop-down list. This will change all relevant IRC Forecast Methods definitions.
5. Click **Apply**.

19.8 Data Loader Procedure

Stage Forecast Rate Loader procedure loads forecast rates definitions into the OFS ALM Forecast rates tables from the 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, you can view the information in the Forecast Rate Summary page.

For more information on how to set up the procedure, see the Stage Forecast Rates Loader section of Oracle Financial Services Analytical Applications Data Model Utilities User Guide.

To execute the **Data Loader** procedure, follow these steps:

1. Navigate to the **Forecast Rates Summary** page.
2. Click **Data Loader Execution**. This will execute all the available Forecast Rates set up in the data loader for Direct Input and Structured Change methods. A warning message is displayed: *Update all available Forecast Rates?*. Click **Yes**.

20

Prepayment Rules

This module describes the procedure for working with and managing Prepayment Rules. One of the major business risks faced by financial institutions engaged in the business of lending and borrowing is prepayment and early redemption risk. Prepayment risk is the possibility that borrowers might choose to repay part or all 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.

Topics:

- Search Prepayment Rule. For more information, see the [Searching for Rules](#) section.
- [Create Prepayment Rules](#)
- View and Edit Prepayment Rule. For more information, see the [View and Edit the Rule](#) section.
- Copy Prepayment Rule. For more information, see the [Copy the Rule](#) section
- Delete Prepayment Rule. For more information, see the [Delete the Rule](#) section

20.1 Create Prepayment Rules

You create a Prepayment Rule to define prepayment assumptions for new products.

Figure 20-1 Prepayment Rule Page

Product	Calculation Method	Conditional Assumption	Status
<input type="checkbox"/> test_1	Arctangent	Yes	Defined
<input type="checkbox"/> Orphan Branch			
<input type="checkbox"/> dhd			
<input type="checkbox"/> dhdf			
<input type="checkbox"/> test1013			
<input type="checkbox"/> test_2008			

To create a new Prepayment Rule, follow these steps:

- Click **Add** icon from the top of the **Prepayment Rule Summary** Page.
- Enter the following Details.

Table 20-1 Create Prepayment Rule

Fields	Description
Name	Enter the name of the Prepayment Rule.
Description	Enter the description of the Prepayment Rule. This is an optional field.
Folder	Select the Folder where the Prepayment Rule needs to be saved.
Access Type	Select the Access Type as Read-Only or Read/Write.

- 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.
- Select Product(s) from **Assumption Browser**.
- Click **Add** from **Assumption Browser** Section. For more information, see the Defining Prepayment Methodologies.

20.2 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. Typically, 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.

Once you have created a Prepayment Rule, you can assign prepayment methodologies to product-currency combinations using Node Level Assumption. For more information, see [Defining Prepayments Using Node Level Assumptions](#) section.

20.2.1 Defining Prepayments 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.

Prerequisites

Performing basic steps for creating or editing a Prepayment Rule.

Procedure

This table describes key terms used for this procedure.

Table 20-2 Key Terms used for Prepayment Rules

Terms	Description
Calculation Method	The method used to model prepayment behavior of instruments. You can choose from four prepayment calculation methods: Constant, Prepayment Model, PSA, and Arc tangent.
Cash Flow Treatment	Allows you to specify one of the following two ways in which prepayments are made. <ul style="list-style-type: none"> • Refinance: This is the most 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.
Prepayment Date	You can select when to calculate prepayment, either on normal payment dates or user-defined tenor.
Payment Event Type	When prepayment is calculated on payment dates then this option allows you to specify type of event when prepayment occurs. By default, "Principal and Interest" is selected.
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	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. <ul style="list-style-type: none"> • 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.

Table 20-2 (Cont.) Key Terms used for Prepayment Rules

Terms	Description
Seasonality	<p>This table allows you to specify seasonality adjustments. Seasonality refers to changes in prepayments that occur predictably at given times of the year.</p> <p>Seasonality adjustments are based on financial histories and experiences and should be modeled when you expect the amount of prepayments made for certain types of instruments to increase or decrease in certain months.</p> <p>The default value for seasonality factors is 1, which indicates that no seasonality adjustment is made for a month. Changing the seasonality factors is optional. You can change the seasonality factors for none, one, or multiple months.</p> <p>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.</p>

1. Navigate to the Prepayment Assumption Details Page after selecting a Currency and one or more products from the hierarchy.
2. Select a **Cash Flow Treatment type**, **Refinance** or **Curtailement**.
3. Refinance is the most used method.
4. Select a **Calculation Method** as 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, no prepayment 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.

5. Define the parameters and annual prepayment rates for the selected Calculation Method as Constant, Prepayment Model, PSA or Arctangent.

 **Note:**

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:

- [Defining the Constant Prepayment Method](#)
- [Defining the Prepayment Model Method](#)
- [Defining the PSA Prepayment Method](#)
- [Defining the Arctangent Calculation Method](#)

6. 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.
- Complete the process by clicking **Save**.

When you click Save, the prepayment assumptions are saved and the **Prepayment Rule Summary** Page is displayed.

20.2.2 Defining Constant Prepayment Method

Use this procedure to define prepayment assumptions using the Constant Prepayment Method. The Constant Prepayment Method calculates the prepayment amount as a flat percentage of the current balance. You can create your own origination date ranges and assign a particular prepayment rate to all the instruments with origination dates within a particular Origination Date range.

Prerequisites

Performing basic steps for creating or updating a Prepayment Rule.

Procedure

Users also have two options for determining the timing of the Constant Prepayment assumption. The options include:

- **Use Payment Dates:** This is the default option. If this option is selected, then Constant Prepayment Runoff will occur on scheduled payment dates only.
- **User Defined Prepayment Tenors:** If this option is selected, users can specify any runoff timing. For example, users might choose to define the prepayment to the Runoff on the first day of the forecast.

The above options will be available only for Asset Instrument types.

To define constant prepayment within the Prepayment Rule, follow the steps given in below sections:

- [Use Payment Dates](#)
- [User Defined Prepayment Tenors](#)

Use Payment Dates

1. Select the **Use Payment Dates** Option.
2. Select the **Payment Event Type** Option.
3. Select the **Start Origination Date** using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.
The first cell in the Start Origination Date Column and all the cells in the End Origination Date Column are read-only. This ensures that all possible origination dates must support 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.
4. 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.
5. The **Percent** column represents the actual annualized prepayment percentage that the system uses to generate the principal runoff during the Cash Flow calculations.
6. Click **Add Row** to add additional rows and click the corresponding **Delete** button to delete a row.
7. You can add as many rows as possible in this table using **Add Multiple Row** Option. However, you need to enter relevant parameters for each new row.
8. You can also use the **Download Excel** feature to export the Prepayment rate information that is displayed on screen, modify, and copy-paste it back in the grid.
9. Define Seasonality assumptions if 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.

User Defined Prepayment Tenors

1. Select the **User Defined Prepayment Tenors** Option. This option allows you to specify the term and multiplier to the Prepayment Date for the row. The term is used to derive Prepayment Dates with reference to As of Date.
2. You can calculate the prepayment rate based on Current/Reducing Balance and Annual/De-annual Prepayment Rate.
3. Select the **Balance Type** as **Current Balance** or **Reducing Balance**.
 - If the Balance Type is selected as Current Balance, then the prepayment amount will be calculated using Principal Balance on As of Date. That is, without reducing the balance by any payment/prepayment that may have occurred between as of the date and prepayment date.
 - If the Balance Type is selected as Reducing Balance, then the prepayment amount will be calculated using balance as on Prepayment Date. That is, after reducing the Principal Balance by any payment/prepayment that may have occurred between as of date and prepayment date.
4. Select the Prepayment Rate Type as Annual Prepayment Rate or De-annual Prepayment Rate.
When the Annual Prepayment Rate is selected then the prepayment rate entered in the screen is directly used.

In the other case, the rate entered in the screen is de-annualized before calculating the prepayment amount.

5. Enter the **Start Origination Date** and **End Origination Date** ranges, add additional ranges as required using the Add Row button.
6. Enter the term to Runoff Tenor and Multiplier for each of the date ranges.
7. Enter the **Annual Prepayment Rate Percent** for each of the date ranges.
8. Enter 'Repeat' if you want the same rate prepayment to occur multiple times. By default, it is set to 1.
9. Click **Add Row** to add additional runoff % rows and click the corresponding **Delete** button to delete a row.
You can add as many rows as possible in this table using **Add Multiple Row Option**. However, you need to enter relevant parameters for each new row.
10. 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.

20.2.3 Defining Prepayment Model Method

Use this procedure to define prepayment assumptions using the Prepayment Model Calculation 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 rate.

Prerequisites

- Prepayment Model must be created.
- Performing basic steps for creating or updating a Prepayment Rule.

Procedure

Users also have two options for determining the timing of the Prepayment Model assumption. The options include:

- **Use Payment Dates:** This is the default option. If this option is selected, then Prepayment Model Runoff will occur on scheduled payment dates only.
- **User Defined Prepayment Tenors:** If this option is selected, users can specify any runoff timing. For example, users might choose to define the Prepayment to the Runoff on the first day of the forecast.

The above options will be available only for Asset Instrument Types.

To define Prepayment Model within the Prepayment Rule, follow the steps given in below sections:

- [Use Payment Dates](#)
- [User Defined Prepayment Tenors](#)

Use Payment Dates

1. Select the **Use Payment Dates** Option.
2. Select the **Payment Event Type** Option.
3. Select the **Start Origination Date** using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.
The first cell in the Start Origination Date Column and all the cells in the End Origination Date Column are read-only. This ensures that all possible origination dates must support 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.
4. Enter the Coefficient (if needed) by which the Prepayment Rate should be multiplied and select a predefined prepayment model that you want to apply to the instruments having origination dates in a particular Start Origination-End Origination Date range
5. Click **Add Row** to add additional rows and click the corresponding **Delete** Button to delete a row.
6. You can add as many rows as possible in this table using **Add Multiple Row** Option. However, you need to enter relevant parameters for each new row.
7. You can also use the **Download Excel** feature to export the Prepayment rate information that is displayed on screen, modify, and copy-paste it back in the grid.
8. Define Market Rate Definition.
9. Define the source for the Market Rate by Selecting an Index (Interest Rate Code) from the list of values.
10. Enter the Spread. The spread is added to the rate from the underlying interest rate curve to determine the market rate.
11. Select an **Associated Term** as Remaining Term, Reprice Frequency, or Original Term.
12. Define Seasonality assumptions if 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.

User Defined Prepayment Tenors

1. Select the **User Defined Prepayment Tenors** Option. This option allows you to specify the term and multiplier to the prepayment date for the row.
2. You can calculate the Prepayment Rate based on Current/Reducing Balance and Annual/De-annual Prepayment Rate.
3. Select the **Balance Type** as **Current Balance** or **Reducing Balance**.
 - If the Balance Type is selected as Current Balance, then the Prepayment Amount will be calculated using CUR_PAR_BAL on As of Date. That is, without reducing the balance by any payment/prepayment that may have occurred between as of the date and prepayment date.
 - If the Balance Type is selected as Reducing Balance, then the prepayment amount will be calculated using balance as on Prepayment Date. That is, after

reducing the CUR_PAR_BAL by any payment/prepayment that may have occurred between As of Date and Prepayment Date.

4. Select the **Prepayment Rate Type** as **Annual Prepayment Rate** or **De-annual Prepayment Rate**.
When the Annual Prepayment Rate is selected then the prepayment rate entered in the screen is directly used.

In the other case, the rate entered in the screen is de-annualized before calculating the Prepayment Amount.
5. Specify the Prepayment Model Parameters.
6. Select the Start Origination Date using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.
7. Enter the Coefficient (if needed) by which the Prepayment Rate should be multiplied. This multiple is applied to the instruments for which the Origination Date lies in the range defined in the Start Origination Date-End Origination Date fields.
8. Select a predefined prepayment model from the Prepayment model Rule list of values. Click the **View Prepayment Model** 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.
9. Click **Add Another Row** to add additional rows and click the corresponding **Delete** button to delete a row.
10. You can add as many rows in this table using **Add Multiple Row** Option. However, you need to enter relevant parameters for each new row.
11. You can also use the **Download Excel** feature to export the Prepayment Rate Information that is displayed on screen, modify, and copy-paste it back in the grid.
12. Enter the term to runoff tenor and multiplier for each of the date ranges.
13. Enter 'Repeat' if you want the same prepayment to occurs multiple times. By default, it is set to 1.
14. Define the source for the Market Rate by Selecting an Index (Interest Rate Code) from the list of values.
15. Enter the Spread. The spread is added to the rate from the underlying Interest Rate Curve to determine the Market Rate.
16. Select an **Associated Term** as Remaining Term, Reprice Frequency, or Original Term.
17. 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.

20.2.4 Defining PSA Prepayment Method

Use this procedure to define Prepayment Assumptions using the PSA Prepayment Method. The PSA Prepayment method (Public Securities Association Standard Prepayment Model) is a Standardized Prepayment Model that is built on a single dimension, expired term. The PSA Curve is a schedule of prepayments which 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. PSA Speed inputs can be between 0 and 1667.

Prerequisites

Performing basic steps for creating or updating a Prepayment Rule.

Procedure

Prepayment under this method occurs on Payment Dates only.

1. Select the **Payment Event Type** option.
2. Select the **Start Origination Date** using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.
The first cell in the **Start Origination Date** Column and all the cells in 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.
3. 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 Prepayment Model icon.
The default value is 100 PSA and inputs can range from 0 to 1667.
4. Click **Add Row** to add additional rows and click the corresponding **Delete** Option to delete a row.
You can add as many rows as possible in this table using Add Multiple Row Option. However, you need to enter relevant parameters for each new row.
5. You can also use the **Download Excel** Feature to export the Prepayment Rate Information that is displayed on screen, modify, and copy-paste it back in the grid.
6. 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.

20.2.5 Defining the 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). Use this procedure to define Prepayment Assumptions using the Arctangent Calculation Method.

Prerequisites

Performing basic steps for creating or updating a Prepayment Rule.

Procedure

Prepayment under this method occurs on Payment Dates only.

1. Select the **Payment Event Type** Option.
2. Select the Start Origination Date using the date picker. Alternatively, you can enter the Start Origination Date in the space provided.
3. 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.
4. Click **Add Another Row**.
You can add as many rows as possible in this table using **Add Multiple Row** Option. However, you need to enter relevant parameters for each new row.
5. You can also use the **Download Excel** Feature to export the Prepayment Rate Information that is displayed on screen, modify, and copy-paste it back in the grid.
6. Define the source for the Market Rate by Selecting an Index (Interest Rate Code) from the list of values.
7. Enter the Spread.
The spread is added to the rate from the underlying Interest Rate Curve to determine the Market Rate.
8. Select an **Associated Term** as Original Term, Reprice Frequency, or Remaining Term.
9. 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.

20.3 Defining Early Redemption Assumptions

If you are working with deposit products, it is possible to define Early Redemption assumptions within the Prepayment Rule. While defining 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.

Prerequisites

- Performing basic steps for creating or updating a Prepayment rule.
- To define Early Redemption assumptions, the account type for the selected product must be a Liability.

Procedure

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 Maturity Date ranges of the instruments rather than Origination Date ranges

Users also have two options for determining the timing of the early redemption assumption. 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 runoff on the first day of the forecast.

To define Early Redemptions within the Prepayment Rule, follow the steps given below:

Use Payment Dates

1. Select the Use Payment Dates option.
2. Enter the Start Maturity and End Maturity Dates.
3. 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 Maturity dates have supporting reference values when Prepayment assumption lookups occur. Each row in the End Maturity Date column is filled in by the system when you click Add Row or save the rule. The first Start Maturity 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 prior to the previous End Maturity Date field.
4. 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.
5. The Percent column represents the actual annualized prepayment percentage that the system uses to generate the principal runoff during the cash flow calculations.
6. Click Add Row to add additional rows and click the corresponding Delete icon to delete a row.
7. You can add as many rows in this table as you require. However you need to enter relevant parameters for each new row.
8. You can use Data Input Helper feature. For more information, see Data Loader section.
9. You can also use the Excel import/export feature to add the Prepayment rate information. For more details, see Excel Import/Export section.

User Defined Redemption Tenors

1. Select the User Defined Redemption Tenors option. This option allows you to specify the term to runoff for the particular row.
2. Enter the Start Maturity and End Maturity date ranges, add additional ranges as required using the Add Row button.
3. You can calculate the prepayment rate based on Current/Reducing Balance and Annual/De-annual Prepayment Rate. Select the Balance Type as Current Balance or Reducing Balance.
4. If the Balance Type is selected as Current Balance, then the prepayment amount will be calculated using CUR_PAR_BAL on As of Date. That is, without reducing the balance by any payment/prepayment that may have occurred between as of date and prepayment date.
5. If the Balance Type is selected as Reducing Balance, then the prepayment amount will be calculated using balance as on Prepayment Date. That is, after reducing the CUR_PAR_BAL by any payment/prepayment that may have occurred between as of date and prepayment date.
6. Select the Prepayment Rate Type as Annual Prepayment Rate Or De-annual Prepayment Rate.

7. When Annual Prepayment Rate is selected then prepayment rate entered in screen is directly used. In the other case, rate entered in screen is de-annualised before calculating prepayment amount.
8. Enter the Start Maturity Date and End Maturity Date ranges, add additional ranges as required using the Add Row button.
9. Enter the term to runoff tenor and multiplier for each of the date ranges.
10. Enter the early redemption runoff percentage for each of the date ranges.
11. Enter 'Repeat' if you want same prepayment to occur multiple times. By default it is set to 1.
12. Click Add Row Delete.
13. Define Seasonality assumptions as required to model date specific adjustments to the annual prepayment rate or early redemption rate. Inputs act as multiplier, for example an input of 2 will double the runoff rate in the indicated month.

The manner in which prepayment / redemption tenor is interpreted has changed from ALM 8.0.7.0.0 onwards in case of user defined prepayment and user defined early redemption. Earlier runoff occurred on "As of date + Prepayment / early redemption tenor". From ALM 8.0.7.0.0 onwards only first runoff occurs on "As of date + Prepayment / early redemption tenor". Subsequent runoff occur on "Previous prepayment / early redemption date + Prepayment / early redemption tenor". Thus customers who are upgrading or migrating to ALM 8.0.7.0.0 from a previous release must appropriately modify tenors in prepayment rules where user defined prepayment tenor and user defined early redemption tenor have been used.

20.4 Associating Conditional Assumptions with Prepayment Rules

Oracle Asset Liability Management extends setup and maintenance of assumptions by allowing users to integrate conditional logic (optional) into the setup of, prepayment methods. You can define prepayment methodologies using IF-THEN-ELSE logic based on the underlying characteristics of your financial instruments, such as dates, rates, balances, and code values. The Conditional Assumption UI is accessed from the Assumption Browser by selecting the Conditional Assumption icon.

The conditional logic is defined through use of Data Filters and/or Maps. These existing objects provide the building blocks for defining Conditional logic. For example, each Data Filter can provide the logic for a specific condition. In the example below, the where clause is "Adjustable Type Code = 'Adjustable Rate'". This type of Data Filter can be selected within the Conditional Assumption UI.

Similarly, a Mapper object provides the necessary reference to one or more hierarchies, when dimension / hierarchy data is needed to define conditional logic. In the example below, this map refers to a hierarchy created on the Organization Unit dimension.

 **Note:**

Maps are accessed from the Infrastructure (HOME) page. You can find them at the following path:

Navigate to Common Object Maintenance, select Unified Analytical Metadata, then select Map Maintenance.

To create a map, use the following steps:

1. Navigate to Map Maintenance.
2. Select Add icon to create new Map.
3. On the left hand side, select one or more hierarchies that were enabled in the initial step.
4. Fill in required information, that is Name, Effective Dates, and Entity Name.
5. Click Save button.
6. From the Map Maintenance Summary page, select the Map and the icon for "Mapper Maintenance".
Here, you will see the hierarchy and all parent/child relationships.

The range of product attributes supported for conditional assumptions and available for use within Data Filters is determined by columns which are part of the "Portfolio" definition. The "Portfolio" table class is seeded with the installation, and can be extended to include user defined columns.

For more information on adding user defined columns to the Portfolio table class, see [Data Model Utilities Guide](#).

When using mappers, Conditional Assumptions can be attached to any level of the hierarchy, allowing assumptions to be inherited from parent nodes by child nodes.

For example, you can use the Org Unit column to drive the assignment of Transfer Pricing Methods for all members of a particular Organization. You can create one Conditional Assumption to convey the entire Transfer Pricing Methodology logic and attach it to the top-level node of the Org Unit hierarchy. All nodes below the top-level node will inherit the same Transfer Pricing assumption.

The logic included in a Conditional Assumption determines the specific Transfer Pricing method, Prepayment assumption or Adjustment Rule that the system will assign to each individual instrument record at run time.

The Conditional Assumption screen allows users to select explicit conditions (from Data Filters and/or Maps) and apply methods and rule selections to each condition directly. The Filter Conditions are processed by the engine in the order that they appear on the screen. As soon as a condition is satisfied, the related assumption is applied.

If an instrument record does not meet any of the conditions, then the rule logic reverts to the standard assumption that is directly assigned to the Product / Currency combination. In the example below, you can see that Fed Funds has both a direct assignment and a conditional assumption. If the condition is not met, the "Fixed Rate" assumption (ELSE condition) will be applied. In the case of Reverse Repo's, there is only a Conditional Assumption. In the absence of an ELSE assumption, the engine will

use the conditional assumption in all cases for the Product/Currency pair. To avoid this, users should define the Standard/Else assumption with an appropriate input.

Conditional Assumptions can be applied only to detailed account records (data stored in the Instrument Tables).

21

Prepayment Models

This module describes the procedure to build 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 Prepayment Model consists of the Prepayment Dimensions and the Bucket Values for these Dimensions. 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.

The procedure for working with and managing Prepayment Models is similar to that of other Oracle Asset Liability Management business rules.

Topics:

- Search Prepayment Model Rule. For more information, see the [Searching for Rules](#) section.
- [Create Prepayment Models](#)
- View and Edit Prepayment Model Rule. For more information, see the [View and Edit the Rule](#) section.
- Copy Prepayment Model Rule. For more information, see the [Copy the Rule](#) section
- Delete Prepayment Model Rule. For more information, see the [Delete the Rule](#) section

21.1 Create Prepayment Models

Creating a Prepayment Model comprises the following sub procedures:

1. Creating Prepayment Models
2. Defining the structure of the Prepayment Model.
3. Assigning Node Values

You can create Prepayment Models with following Rate Calculation options:

- [Manual](#)
- [External Model](#)
- [Integrated Model](#)

21.1.1 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. Once the dimensions and the number of buckets (tiers) are defined, you need to assign values to the buckets.

21.1.2 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, prepayment dimension, used in 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.

21.1.2.1 Prerequisites

To enable the Prepayment Rate Calculation, follow these steps:

1. Log in to OFS AAI as System Administrator.
2. Under the OFS AAI Home Page, navigate to Administration and select **Security Management**.
3. Expand **System Administrator** and select **Function – Role Map**.
4. Associate the SMS-Function of **Prepayment Rate Calculation Process for Add, Edit, View, Delete, Copy, and Run** with the required roles.

21.1.2.2 Manual

Using Manual method, you can select maximum of three prepayment dimension and assign prepayment rates manually to selected dimension.



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).

Below are the steps for Manual method

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.

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:**

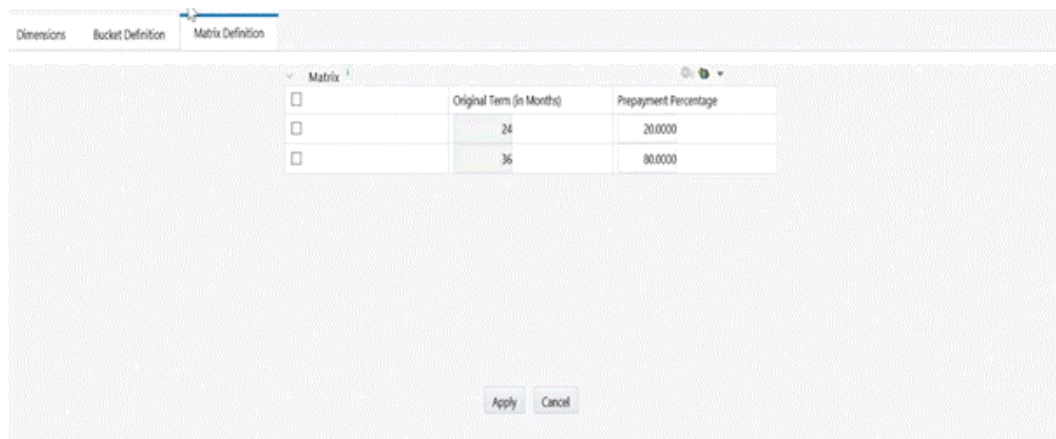
There are certain restrictions while defining Dimensions:

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.

- Assign values for each of the buckets.
- Click **Apply**.
The Prepayment Model, Prepayment Dimensions, and Buckets are saved.
- 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.

Figure 21-1 Manual Prepayment Model



	Original Term (in Months)	Prepayment Percentage
<input type="checkbox"/>	24	20.0000
<input type="checkbox"/>	36	80.0000

Repeat the process for all bucket values of the page driver. To change the bucket value along the page driver, select the required value from the drop-down list.

 **Note:**

Bucket values will be displayed in the drop-down list only if you selected three drivers.

- Click **Apply**. The Prepayment Rates are saved and the Prepayment Model Rule summary page is displayed.

21.1.2.3 Integrated Model

In Integrated Model option, User has the option to select one of the already saved/ confirmed Models. For more information on how Model is defined.

Below steps details how Integrated Model can be used.

1. Select Integrated Model name from Model drop-down list. You can click on Model Search to search an Integrated Model based on certain product and currency combination.
2. Click Apply after selecting Model.
3. Model dimensions would be locked out based on the selected model. Still you need to select lookup method and buckets for each dimension.
4. Define the bucket values for each model dimension.
5. In this mode, prepayment rates would be auto calculated based on the selected model and buckets definition for each dimension. As shown in below screen, click 'Apply' to populate prepayment rate matrix. If user would like, one can still edit the values for few cells in prepayment matrix and 'Save'.
User needs to click on Apply on each page level to save Prepayment rates displayed on that page.
6. In case, model has calculated negative prepayment rate for few cells based on bucket values, you would not be able save the prepayment matrix until all the negative values has been manually updated by the user; as only zero or positive prepayment rates are allowed.
7. A 'Reset' button is given, in case user has changed prepayment rates for few cells. You can still get the model calculated prepayment rates back by pressing 'Reset'.

21.1.2.4 External Model

When you select External Model, Define Equation button will get activated to use external prepayment model. This is useful, when you want to do prepayment modelling outside OFSAA and use the model equation to calculate prepayment rates.

1. Define the Dimensions and click Define Equation.

Figure 21-2 Equation

Operator	Coefficient	Dimension	Power
+	2	Intercept	Disabled
+	1.5	Original Term	2
+	3	Rate Diff	2

Figure 21-3 External Model

The screenshot shows a 'Define Equation' window with the following details:

- Active Time Bucket: BBL_Time_Bucket2
- Prepayment Models
- As Of Date: 04/30/2019
- Assumption Specification > Prepayment Models
- Fields: Operator (+), Coefficient, Dimension (Intercept), Power
- Buttons: Equation, Apply, Cancel

- Define the Equation.
For Example:

Equation becomes:

$$2 + 1.5 * \text{original Term} ^ 2 + 3 * \text{Rate Diff} ^ 2$$

 **Note:**

Before defining equation, you must select dimensions and accordingly dimensions drop-down will display values along with **Intercept**. For example, if you have already chosen Original term and Rate Difference as dimensions, then Dimension drop-down list would displays the following three values:

- Intercept
- Original Term
- Rate Difference

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 new row for each term using Add +. Multiple rows can be added using Add Multiple Rows

- Click Apply on Define Equation window. Click Cancel to navigate back to Prepayment Matrix Screen window.
- Once buckets are defined for final prepayment matrix, matrix would be auto populated.
- Click Apply to save the final prepayment rates matrix as per defined buckets.
Note: User needs to click on Apply on each page level to save Prepayment rates displayed on that page.
- In case, model has calculated negative prepayment rate for few cells based on bucket values, you would not be able save the prepayment matrix until all the negative values

has been manually updated by the user; as only zero or positive prepayment rates are allowed.

7. A 'Reset' button is given, in case user changed a few cells. You can still get the model calculated prepayment rates back again by pressing 'Reset'

21.2 Editing Prepayment Models

As part of editing Prepayment models, you can modify 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.

Prerequisites

Predefined Prepayment Models.

Procedure

1. Search for the Prepayment Model, which you want to edit. For more information, refer to [Searching for Rules](#) section.
2. Select the check box next to the Prepayment Model and select the **Edit**. The Prepayment Model opens in Edit mode.

Procedure to Update Rates

Modify the Prepayment Rates in the table as required. For more information, see the [Editing Prepayment Rates in a Prepayment Model](#).

Procedure to Update Dimensions Values

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. Also, 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.

21.3 Editing Prepayment Rates in a Prepayment Model

Once 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. Use this procedure to add or edit annual prepayment rates in the prepayment model.

Procedure

1. Search for the Prepayment Model, for which you want to define prepayment rates. For more information, see the [Searching 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. 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.

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.

Select the Prepayment Rate Calculation model from 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 Using [External Model](#) section.

Excel Import/Export

Excel import/export functionality is used for adding/editing prepayment rate information. For more details, refer Excel Import/Export.

21.4 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 on a periodic basis. For more information on setting up the automated process, see [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 [Data Model Utilities User Guide](#)

Prepayment Model Analysis

This module describes the procedure for prepayment models analysis.

The Prepayment Model Analysis module will allow you to develop a model for prepayment rate calculations as per the chosen risk factors.

Model building could be a time consuming process given huge data sets and limited IT infrastructure. So to get the latest status of each stage, you can hover over corresponding block in the progress train, a call out will open with milestones status which will help to confirm if the process is still running and how many milestones have already completed.

 **Note:**

Before using the product hierarchy 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.

 **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 of OFS Asset Liability Management Application Pack Installation and Configuration Guide.

In the Oracle Financial Services Analytical Applications Infrastructure home screen, select **Financial Services Asset Liability Management**.

Note: For FTP, select **Financial Services Funds Transfer Pricing Management**. For BSP, select **Financial Services Balance Sheet Planning Management**

1. To access Prepayment Model Analysis window, navigate to ALM Assumption Specification, select **Prepayment Rules** and then select **Prepayment Model Analysis**.

 **Note:**

For FTP, navigate to ALM Assumption Specification. For BSP, navigate to BSP Assumption Specification.

2. The definitions based on the search criteria are listed under the List of Prepayment Model Analysis. You can search on one or more model attributes 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.

Table 22-1 Fields and their Descriptions

Fields	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. Selecting a folder from the drop-down list displays only those Prepayment Model Analysis rule definitions that belongs to the selected folder/segment in the Prepayment Model Analysis rule Summary table.
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: <ul style="list-style-type: none"> • 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 with 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.

Table 22-2 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.

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 table provides the Prepayment Model Analysis details based on the search criteria.

Table 22-3 Prepayment Model Analysis – Columns and Descriptions

Column	Description
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 at 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 rule.

Topics:

- [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](#)

22.1 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.

22.2 Defining a Model

To define a model, follow these steps:

1. Navigate to **Prepayment Model Analysis** window. Click **Add** . The Definition window is displayed.

Figure 22-1 Prepayment Model Analysis

2. Enter the following details.

Table 22-4 Form Fields to define a Model

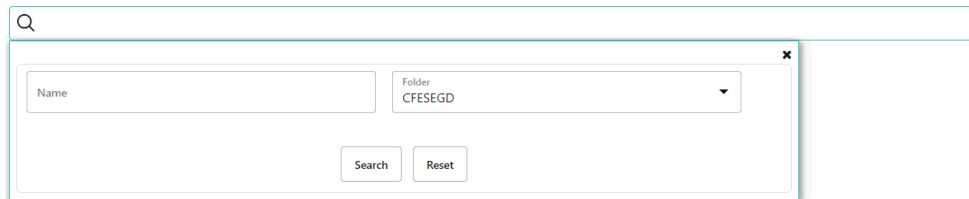
Fields	Description
Name	Enter the name of Prepayment Model Analysis rule
Description	Enter the description of Prepayment Model Analysis rule
Folder	Select the folder where you want to save Prepayment Model Analysis rule
Access Type	Select Access Type as Read-only or Read/Write.
Hierarchy Filter (Folder)	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. Default Currency option is also given, if you want to select the product irrespective of currency in which deal is booked.
Data Filter (Folder)	Select the folder name of data filter for Prepayment Model Analysis rule

Table 22-4 (Cont.) Form Fields to define a Model

Fields	Description
Data Filter	Select the data filter to define the portfolio at more granular level than just, product and currency combination.

3. Click **Apply** to navigate to **Exploratory Data Analysis** window.
4. Exploratory Data Analysis window is used to perform EDA calculations.

Figure 22-2 Exploratory Data Analysis



Enter the following details in Exploratory Data Analysis window.

Table 22-5 Form Fields of Exploratory Data Analysis window

Fields	Description
Sample Size	Sample size of dataset for EDA
Model Population (As of Date Range)	<p>You can define a date range within which one wants to use data for model creation as model population.</p> <p>By Default, Date range would be populated as below:</p> <p>End Date: Max (As of Date) available in Model input Table</p> <p>Start Date: Max [min (As of Date), End Date – 10 Years]</p>
Do Sampling	Select this option to create model based on a data Sample rather than the whole population. By default, Do Sampling is enabled. This would enhance performance due to lesser number of records considered for modelling, without degrading model quality.
Sample Size (Multiplier)	<p>After selecting sample size for EDA, you can select multiplier value. This indicates sample size required for model creation. For example, if 1000, records are selected as sample size for EDA, and multiplier is 6, then a minimum of $1000 \times 6 = 6000$ records would be required for model creation.</p> <p>Note: This checkbox is enabled only if Do Sampling checkbox is selected.</p>

- This window gives complete information about all the risk factors along with prepayment rates. It helps you to decide what all factors could influence the customer's prepayment behavior and would be best for model building.

You can hover over any graph and zoom in to enhance the visibility of the graph.

Click Model Summary to navigate back to the Model Summary window after saving all inputs/EDA graphs defined/generated till this point.

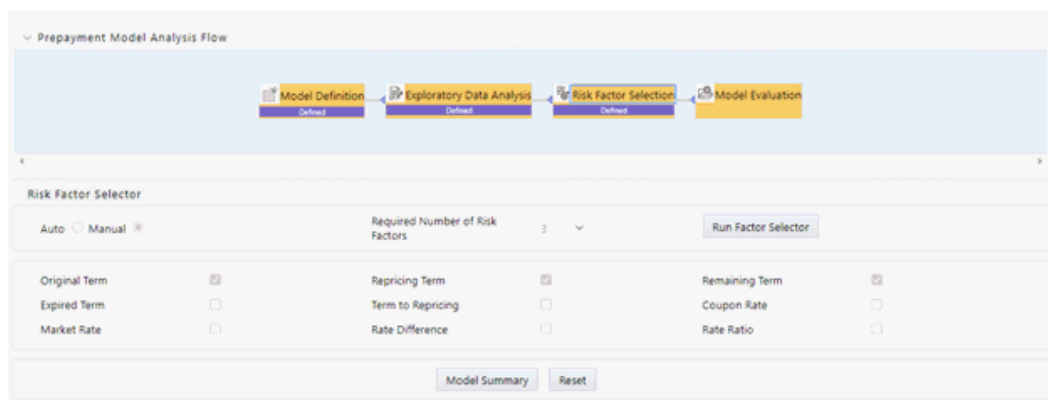
Click Re-Calculate if you want to change the sample size and redo the EDA again. change the sample size and click Re-Calculate.

If you have performed 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 2nd 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 will not be available.

When you hover over Sample size for EDA, it displays Default value (callout) as Default Value is 5000.

- 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 checkbox and click on calculate to perform the EDA.
- Click Next. The **Risk Factor Selection** window is displayed. By default, all the risk factors will be disabled.

Figure 22-3 Risk Factor Selection window



- You can change the risk factor selection mode to 'Manual' and all the risk factors would be available for selection; maximum 3 factors can be selected after that all the risk factors would be disabled again.

When you are in Auto Select Mode, System would perform required calculations, correlation/collinearity analysis in the backend based on the required number of risk factors (Maximum 3), System would auto-select the best representative set of risk factors as per the input data.

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.

- Click Next to navigate to **Model Evaluation** window. A confirmation message is displayed. Click OK.

Figure 22-4 Model Evaluation



10. Click Calculate to view all the evaluation parameters and quality plots.
11. 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. If you are changing parameters and generating different versions of the model, then you can see all the versions, generated with different set of model parameters in the Versions (Model) drop-down. If you have run “model evaluation” only once, then this drop-down would not be 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 will dynamically adjust as per the number of risk factors selected.

Predicted Values Vs Test Sample.

Sample prepayment matrix as per both the models (Linear and Polynomial).

Figure 22-5 Sample prepayment matrix

Sample Prepayment Matrix(Linear)										
REMAINING_TERM	24									
ORG_TERM	REPRICING_TERM									
	0.032873	0.493097	1	2	3	4	6	12	24	36

Risk factors are scaled, kindly click to get scaled equation

Sample Prepayment Matrix(Polynomial)										
REMAINING_TERM	24									
ORG_TERM	REPRICING_TERM									
	0.032873	0.493097	1	2	3	4	6	12	24	36

Risk factors are scaled, kindly click to get scaled equation

User would have option to redefine, values for sample matrix by clicking on “Re-define Sample” button. Below pop up would open up if user would like to re-define sample buckets. Again this pop up would dynamically adjust based on number of risk factors selected in the model.

12. Click **Model Summary** to view Model Summary window, after saving all details.
13. Click **Re-Define Sample** if you want to modify risk factor values for sample matrix. This pop up would dynamically adjust to display 1,2 or 3 dimensions as per the chosen model.

Figure 22-6 Risk factor values

<input type="checkbox"/>	ORG TERM(in Months)	REPRICING TERM(in Months)	REMAINING TERM(in Months)
<input type="checkbox"/>	24	0.032873	24
<input type="checkbox"/>	48	0.493097	48
<input type="checkbox"/>	72	1	72
<input type="checkbox"/>	96	2	96
<input type="checkbox"/>	120	3	120
<input type="checkbox"/>	144	4	144
<input type="checkbox"/>	180	6	180
<input type="checkbox"/>	216	12	216
<input type="checkbox"/>	240	24	240
<input type="checkbox"/>	360	36	360

In case you want to update values on which sample matrix is generated, you can click on 'Re-define Sample'. Below window would open up where you can update the risk factor values:

Add row using **Add +**. You can add multiple rows or delete multiple rows using buttons in panel 1. Default sample matrix is 10*10, but once you re-define sample, matrix can be truncated to any dimensions.

The redefined matrix will be saved along with 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, user can choose any one of linear/polynomial model.

Click **Save Model** to save the model. Same model could be referred to populate prepayment rate matrix.

Click Re-Calculate to re-evaluate 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. Again, process would start from that step onwards and updated EDA plots/graphs would be saved for the model.

If you want to update selected risk factors, click Risk Factor Selection block and change risk factors. Again, process would start from that step onwards and updated risk factors would be saved for the model.

Advance Details – To verify the model quality, all the model statistics are given on a different screen, which would be available with 'Advance Details' button like R2, F value, P – Value, and so on.

Figure 22-7 Advance Details

The screenshot displays the 'Model Evaluation' interface with the following details:

- Model Evaluation Settings:**
 - Versions(Model): 61 (01/28/2021 11:13:51)
 - Type of Scaling: MinMaxScaler
 - Threshold R Squared: 0.65
 - Outlier Capping: 1.5
 - Multi-Collinearity Threshold: 0.7
- Linear Regression Model Summary:**
 - OLS Regression Results
 - Dep. Variable: y
 - Model: OLS
 - Method: Least Squares
 - Date: Thu, 28 Jan 2021 11:13:52
 - No. Observations: 10
 - Df Residuals: 8
 - Df Model: 1
 - Covariance Type: nonrobust
 - R-squared: -inf
 - Adj. R-squared: -inf
 - F-statistic: -8.000
 - Prob (F-statistic): 1.00
 - Log-Likelihood: 344.30
 - AIC: -684.6
 - BIC: -684.0

	coef	std err	t	P> t	[0.025	0.975]
const	0.9313	1.32e-16	7.03e+15	0.000	0.931	0.931
ORG_TERM	0	0	nan	nan	0	0
REPRICING_TERM	2.22e-16	2.66e-16	0.834	0.429	-3.92e-16	8.36e-16
REMAINING_TERM	0	0	nan	nan	0	0

 - Omnibus: 1.690
 - Prob(Omnibus): 0.429
 - Skewed: -0.579
 - Kurtosis: 1.864
 - Durbin-Watson: 0.237
 - Jarque-Bera (JB): 1.097
 - Prob(JB): 0.578
 - Cond. No.: inf
- Polynomial Regression Model Summary:**
 - OLS Regression Results
 - Dep. Variable: y
 - Model: OLS
 - Method: Least Squares
 - Date: Thu, 28 Jan 2021 11:13:53
 - No. Observations: 10
 - Df Residuals: 7
 - Df Model: 2
 - Covariance Type: nonrobust
 - R-squared: -inf
 - Adj. R-squared: -inf
 - F-statistic: -3.500
 - Prob (F-statistic): 1.00
 - Log-Likelihood: 335.50
 - AIC: -665.0
 - BIC: -664.1

	coef	std err	t	P> t	[0.025	0.975]
const	0.9313	4.37e-16	2.13e+15	0.000	0.931	0.931
x1	-3.115e-17	8.18e-31	-3.81e+13	0.000	-3.12e-17	-3.12e-17
x2	1.332e-15	2.69e-15	0.495	0.636	-5.03e-15	7.7e-15
x3	0	0	nan	nan	0	0
x4	0	0	nan	nan	0	0
x5	0	0	nan	nan	0	0
x6	0	0	nan	nan	0	0
x7	-4.441e-16	2.53e-15	-0.176	0.866	-6.42e-15	5.53e-15
x8	0	0	nan	nan	0	0
x9	0	0	nan	nan	0	0

 - Omnibus: 1.454
 - Prob(Omnibus): 0.483
 - Skewed: -0.629
 - Kurtosis: 2.034
 - Durbin-Watson: 0.574
 - Jarque-Bera (JB): 1.048
 - Prob(JB): 0.592
 - Cond. No.: inf
- Warnings:**
 - [1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
 - [2] The smallest eigenvalue is 0. This might indicate that there are strong multicollinearity problems or that the design matrix is singular.

Reset button on each screen would help to delete all the calculations done in subsequent steps. That is, if you have done EDA and selected particular EDA version to do further calculations like 'Risk factor Selection' or 'Model Evaluation'. In case you are not satisfied with model, you can go back to EDA, click 'Reset' to clear out the details/calculations performed in subsequent stages and do recalculate with a different set of parameters.

Following are the default values/usage of Parameters:

Default values/usage of Parameters

Parameters

EDA Sample Size

Default Values

This would allow 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 Do_Sampling parameter to false. Procedure for the same is given in next section.

Parameters	Default Values
Type of scaling	Many a times, risk factors are not in consistent range, e.g. one of the risk factor's values could be in 1-500 range but another risk factor could be just in 2-3 range. So, risk factor 1 would influence the model more and you would get a biased model. So, to make all the risk factors consistent, scaling is used. There are two types of scaling: Min-Max Scaling = $(X - \min) / (\max - \min)$ Standard = $(X - \text{Mean}) / \text{Std. Deviation}$
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 would make model unstable. So based on this value, if variables are highly correlated or above defined threshold, one of them would be dropped while model creation.
Outlier Capping	This would allow user to reject values beyond certain percentile. Sometimes, input data has few extreme values which could distort the model. So you could reject those values and get a stable model.

Exploratory Data Analysis:

Sample Size (EDA) - 5000

Model Population Range - It would be auto-populated based on the data in risk factor table. Maximum would be 10 years older from latest available date. In case you think, older data is not relevant, as 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

22.3 Editing Prepayment Model Analysis Rule

To edit a rule, perform following steps:

1. Navigate to **Prepayment Model Analysis** window.
2. Search for Prepayment Model Analysis rule which you want to edit. For more information, see the [Searching 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, only model type can be changed from linear to polynomial or vice versa and click Apply.
5. Click Save to navigate back to Prepayment Model Analysis summary window.

22.4 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 [Searching 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. (Optional) Enter a brief description of the rule.
7. Select the access type.
8. Click **Save** .

22.5 Deleting Prepayment 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 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 [Searching for Rules](#) section.
3. Select the Prepayment Model Analysis appropriate rule and click **Delete**.

22.6 Dependency Checking

You can check dependencies for rules to know where a particular rule, dimension, member, attribute, IRC has been used. This also prevents 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 further information, see the [Searching 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.

 **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, and Folder.

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.

Prepayment Rate Calculation Process

Prepayment are associated with Assets and Liabilities that have fixed maturities and have experienced a change in scheduled contractual cash flows on a fixed maturity instrument results in a prepaid event and should be captured.

The Prepayment Rate Calculation Process helps you to create data for the subsequent step prepayment modelling by performing following tasks:

- Define the product for which prepayments behavior need to be learnt (Product Selection block).
- Specify the parameters to calculate various risk factors which can influence prepayments, such as, As of Dates reference term, threshold prepaid amount, Market rate calculation parameters.
- Execute or run the Prepayment Rate Calculation process and generate results through Prepayment Rate Calculation Process Summary Page.

Topics:

- [Creating a Prepayment Rate Calculation Process](#)
- [Executing a Prepayment Rate Calculation Process](#)
- [Viewing Prepayment Rate Calculation Process](#)
- [Editing Prepayment Rate Calculation Process](#)
- [Deleting Prepayment Rate Calculation Process](#)
- [Performance Tuning Prepayment Rate Calculation Processes](#)

23.1 Creating a Prepayment Rate Calculation Process

The Prepayment Rate Calculation Process will compare current period instrument data with prior period based on the ID number to identify prepaid events. When prepayments are detected, the related record's prepayment rate and following risk factors:

- Original Term
- Repricing Term
- Remaining Term
- Expired Term
- Term to Reprice
- Coupon Rate
- Market Rate
- Rate Difference
- Rate Ratio

This is copied to the FSI_O_HIST_PPMT_RATE_DETAILS table. Later, this table will be used as source for prepayment rates modelling.

To create a Prepayment Calculation Process, follow these steps:

1. From the LHS menu, select Asset Liability Management, select ALM Processing, and then select Prepayment Rate Calculation Process to display the Prepayment Rate Calculation Process screen.

The following table describes key terms used for this procedure.

Table 23-1 Fields for creating a Prepayment Rate Calculation Process

Term	Description
Folder	The folder where you can save the definition. You can give other users, read/write or read only privileges.
Filter	Filters allow you to restrict your data selection based on any various account attributes like fixed/floating rate, amortization code etc. You can define filters under Common Object Maintenance and reference your filter within the Product Selection block of your Process. The choice of the data filter would determine the instrument records that should be picked from current and prior As-of-date for comparative analysis.
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 from current and prior As-of-date date would be picked for comparison. Following table are available as source: Loan Contracts Mortgages Term Deposits
Minimum Prepaid Amount	Minimum Prepaid amount applies to both Positive and Negative prepaid amounts. If the user enters minimum prepaid as 50, it means that minimum prepaid amount ranges from -50 to +50. If the Prepaid Amount falls within this range, then the record would not be considered for any calculations.
Freeze Process	The freeze button will help you to confirm if the process is complete and ready to run or further changes are required and it is an incomplete process which can not run.

2. Product Selection: This block will help you to define the accounts where prepayments took places and should be considered to learn prepayment behavior.

3. 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:

§ 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 is excluded. This input allows you to filter very small / insignificant prepaid amounts, reducing the amount of data copied into risk factor table for 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 if 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 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 dropdown containing days, months and years.

§ Similarly, market rate can be defined as arithmetic average over historical range of 1 month, 6 months starting prior As-of-Date. Historical term is also given with a drop-down containing days, months and years.

6. 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.

23.2 Viewing Prepayment Rate Calculation Process

To view any of the saved processes, you can select the process using check box next to each process and click on view button.

23.3 Editing Prepayment Rate Calculation Process

To edit any of the saved processes parameters, you can select the process using check box next to each process and click on edit button

23.4 Copying Prepayment Rate Calculation Process

To copy any of the saved processes, you can select the process using check box next to each process and click on copy button.

A message window opens to confirm the Name, Folder and Access Type for the copied process.

Enter the details and click Save to save the details.

23.5 Deleting Prepayment Rate Calculation Process

To delete any of the saved processes, you can select the process using check box next to each process and click on delete button.

23.6 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 parallel_query field. If the value is given as "ENABLED", the engine uses the PARALLEL_DEGREE input and sets the degree of parallelism for execution of the queries within the Prepayment Rate Calculation engine.

These values must be set by the user or implementation team, 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.

23.7 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.

Following two approaches are available to execute the process:

- UI Based Procedure
- Batch Based Procedure

23.7.1 UI Based Procedure

To execute the process using UI based procedure, follow these steps:

1. Navigate to the Prepayment Rate Calculation Process summary page.
2. Select a Process that you want to execute or run.

Note:

The status column indicates whether or not 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.
 4. Select the Task ID (also known as the unique system identifier) to view a report for any processing errors.
If significant processing errors exist, you should re-run your process.
 5. The Prepayment Rate Calculation process is complete.

23.7.2 Batch Based Procedure

Prepayment Rate Calculation Processes can also be executed as batch processes. The following approaches are available:

- Simplified Batch
- ICC Batch
- Run Rule Framework

23.7.2.1 Simplified Batch

To execute the batch with Simplified Batch, follow these steps:

1. From the LHS menu, select Common Object Maintenance, 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.

23.7.2.2 ICC Batch

To execute the batch with ICC Batch, 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.
5. Define the Task ID and Description.
6. Select Components as Transform Data.
7. Select Historical Prepayment Batch 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 follow format (sys Id, User Id), for example: 101000, TPUSER.
9. Save the rule and Execute.

23.7.2.3 Run Rule Framework

To execute the batch with Run Rule Framework, follow these steps:

1. From the LHS menu, select Common Object Maintenance, 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 follow format (sys Id, User Id), for example: 101000, TPUSER.
7. Save the rule and Execute.

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

The Non-Maturity Products Model Analysis Summary Page allows you to do the following:

- [Create Products Model Analysis Rule](#)
- Searching for Products Model Analysis Rule. For more information, see the [Searching for Rules](#) section
- Viewing and Updating Products Model Analysis Rule. For more information, see the [Viewing and Editing Rules](#) section.
- Copying Products Model Analysis Rule. For more information, see the [Copying Rules](#) section.
- Deleting Products Model Analysis Rule. For more information, see the [Deleting Rules](#) section.

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, it filters and displays the list of Non-Maturity Products Models meeting the search criteria. The Non-Maturity Products Model Analysis Summary Window displays the following columns.

Column	Description
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 modified last 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.

Table 24-1 Table: Non-Maturity Products Model Analysis Rule – Icons and Descriptions

Fields	Description
Add	Click Add icon to create a new Non-Maturity Products Model Analysis Rule.
Delete	Click Delete icon from Top right corner to delete the Data Creation Process Rule.
Refresh	Click Refresh icon from Top right corner to refresh the Data Creation Process Rule.
View	Click the Action column and select View to view the contents of a Non-Maturity Products Model Analysis Rule in Read mode.
Edit	Click 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 Action column and select Save As to create a copy of an existing Non-Maturity Products Model Analysis Rule.
Delete	Click the Action column and select Delete to delete an existing Non-Maturity Products Model Analysis Rule.
Dependency Check	Click the Action column and select Check Dependency to check the dependency of an existing Non-Maturity Products Model Analysis Rule.

24.1 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 24-1 Creating Non-Maturity Products Model Analysis Rule

3. Enter the details shown in the following table.

Table 24-2 List of process details used for Creating Non-Maturity Products Model Anal

Fields	Description
Model Name	Enter the name of the Non-Maturity Products Model Analysis Rule. This should be unique name. This field accepts Alpha Numeric 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 product is stored on which model need to be build.
Product Hierarchy	Select the Product Hierarchy from available list of hierarchies in 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 24-2 Creating Non-Maturity Products Model Analysis Rule - Exploratory Data Analysis section

The **Exploratory Data Analysis** Window will help you to perform EDA calculations and get a glimpse of data being used for modelling.

5. Enter the following details in the **Exploratory Data Analysis** window.

Table 24-3 Fields on Exploratory Data Analysis

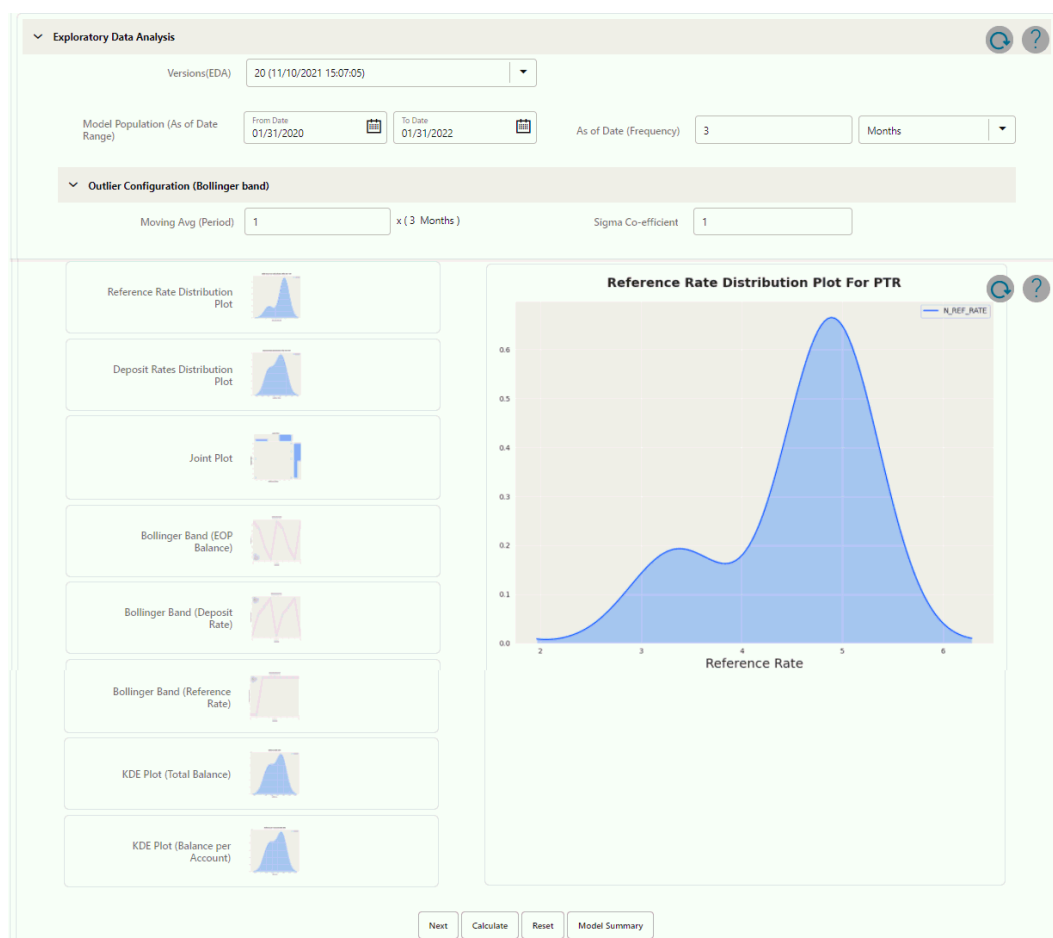
Fields	Description
Model Population (As of Date Range)	You can select a date range which will define the historical period within which data needs to be picked for Model creation By default, the Date range would be populated as below: End Date: Max (As of Date) available in Model input Table. Start Date: Max [min (As of Date), End Date – 10 Years]. Default values are populated from 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 historical period as last three years, in those three years at what regular interval data needs to be picked up from 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.

Table 24-3 (Cont.) Fields on Exploratory Data Analysis

Fields	Description
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.

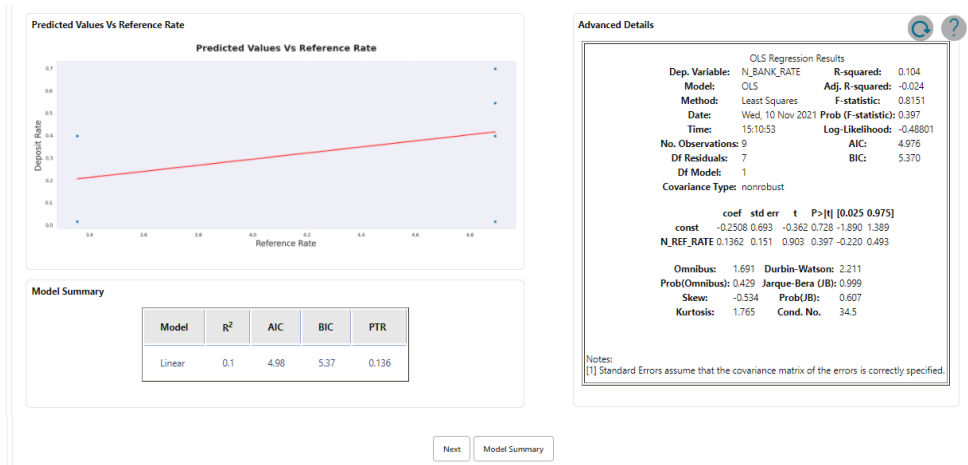
- Click **Calculate** to perform Exploratory Data Analysis and get EDA plots. You can refresh the window using the Refresh button to check if the EDA is completed. When you open EDA window first time for a particular model, Version(EDA) field would not appear as there is no previous version to display. Subsequently, when first version is created and you go for second version, version (EDA) tab will start appearing with previous EDA versions. When EDA version is submitted, a message will appear with version number. You get a pop-up in case last run version was failed. If run was successful, latest version would appear on the UI, when you log back in. **Reset** button resets the entered values to their default values.

Figure 24-3 Exploratory Data Analysis section



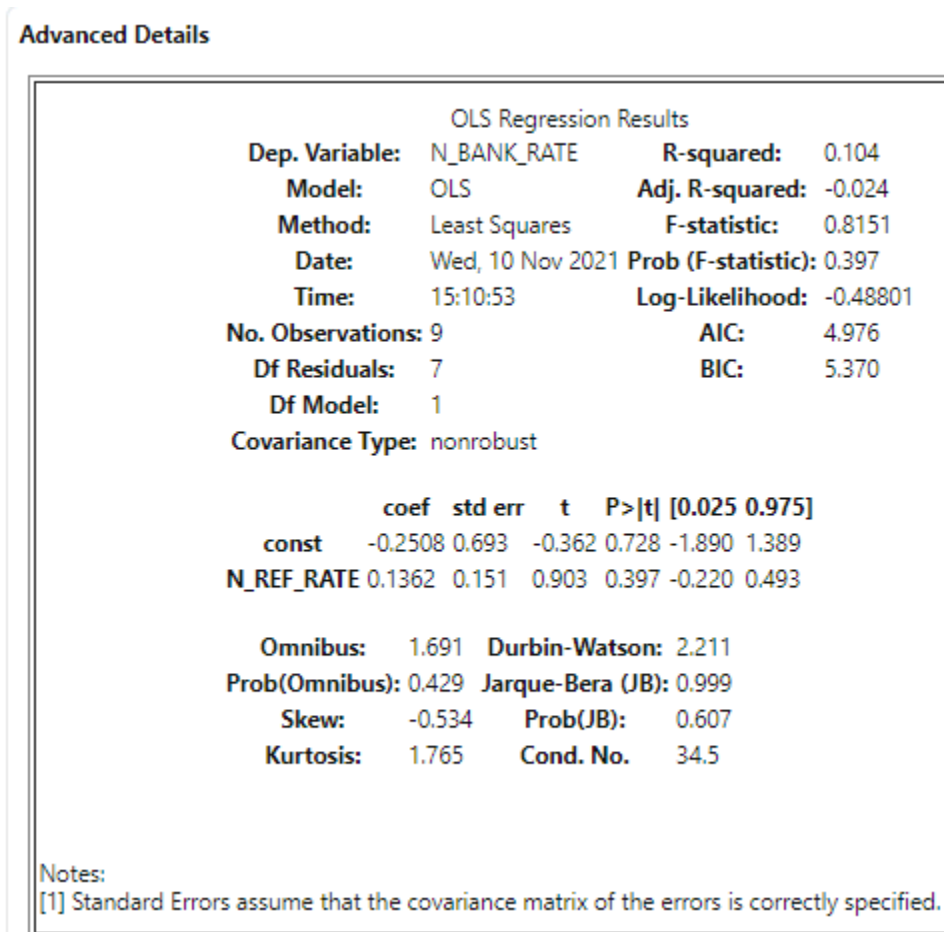
- Click Next to navigate to the **Pass-Through Rate Calculations** window.

Figure 24-4 Pass-Through Rate Calculations



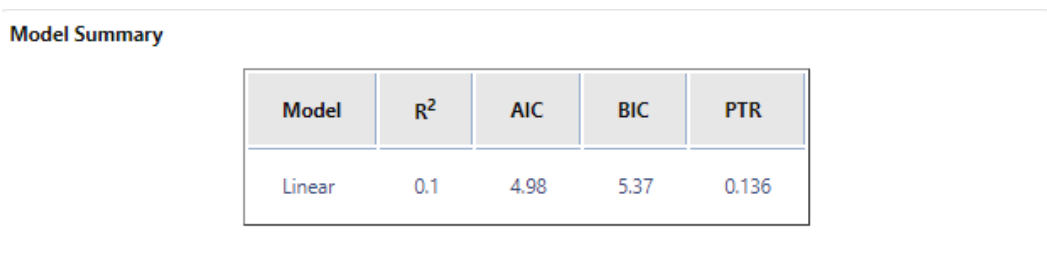
- Click **Calculate** to view all the evaluation parameters and quality plots. Pass-Through Rate calculations are submitted, a message appears with version number. If you come back after some time, you get a pop-up in case last run version was failed. This window shows all the model quality parameters and graphs. At this stage, Pass through rate or beta between 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 24-5 Advanced Details



The Model parameters like R², AIC, BIC and regression co-efficient will be shown under model summary.(how much change in market rate is passed on to the deposit rate).

Figure 24-6 Model Summary

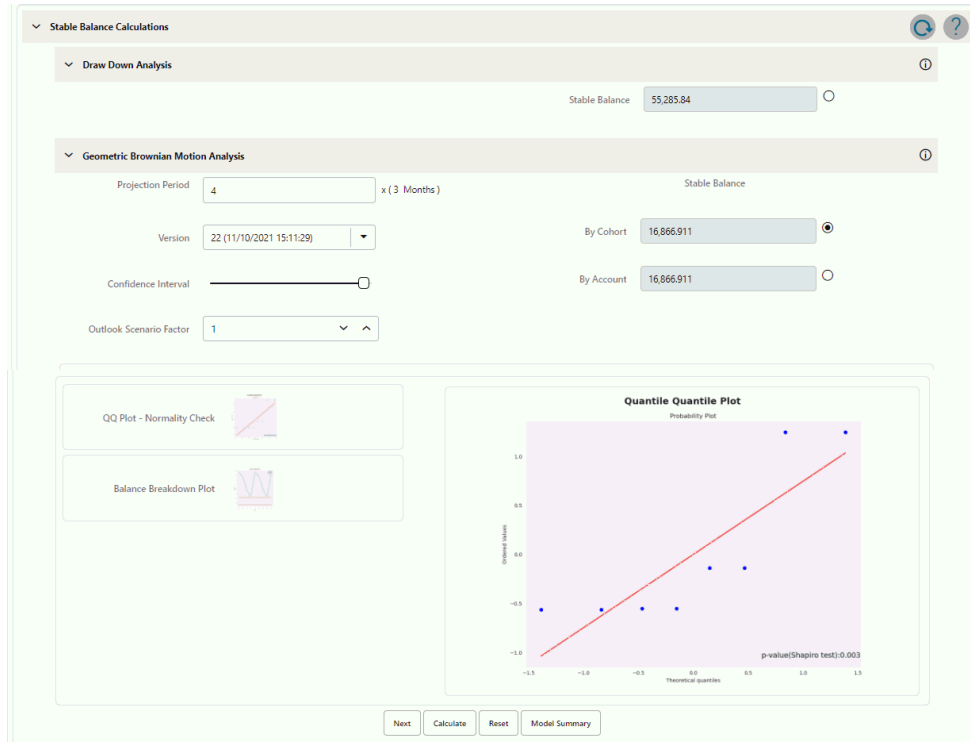


At any stage if user would like to come out of the model analysis module, one can Click on Model Summary button and go back to Non-Maturity products model summary screen and come out of modelling module.

9. Click **Next** to navigate to the Stable Balance Calculation section. This window shows the Projection period. You can set it as required. Projection period can be only be positive

integers which will act as multiplier to As of Date (Freq). E.g. if as of date (Freq) is quarter and projection period is 8 * As of Date (Freq), it implies projection period is 2 years.

Figure 24-7 Stable Balance Calculation



10. To calculate Stable Balance, you can use 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 stable balance.

Geometric Brownian Motion: This approach will first calculate the past Run-offs volatility and assuming 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 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 next step, you must select one radio button to confirm one stable balance on which rest of the subsequent processing will take place. When this window is displayed 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 projection period, confidence interval or Scenario factor is changed, then new version will be generated only for GBM. When you click **Calculate** button, then a pop up is displayed: " GBM version xyz is submitted'. If you come back and 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 24-8 Decay Rate Calculations



For Decay rate calculations, you can choose any one of following three approaches:

- Vintage Analysis
- SARIMAX
- Geometric Brownian Motion

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 Vintage Analysis checkbox if you want to use this in calculation or exclude it from calculations. Vintage analysis needs account-level data for 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 projection period and 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

Figure 24-9 Confidence Interval Range



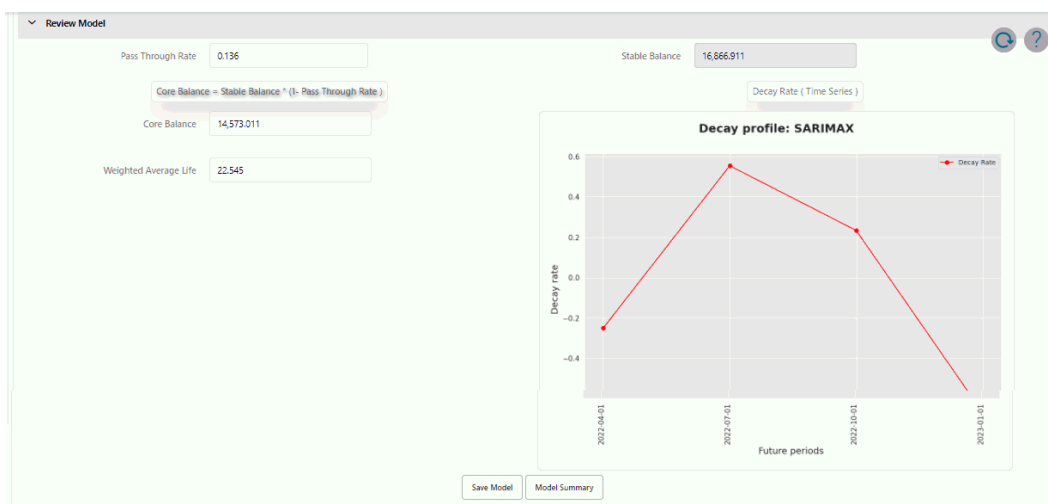
and steps (Default 5%) in which confidence interval will be increased for each calculation. If the range is 80-95%, then the system generates a Decay Rate Profile at 80%, 85%, 90% and 95% interval; using an iterative process, try to calculate a Decay Rate Profile which will give WAL within regulatory 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.

Run-off threshold is a user input, it will define the minimum balance beyond which WAL calculations would not be performed, considering balance become zero at that point.

When this window is launched first time and you press Calculate, Decay Rate is calculated for all three methods, Vintage Analysis, SARIMAX and Geometric Brownian Motion. After first run (when Calculate button does not appear), separate 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 model is saved, it is always be 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 24-10 Review Model section



24.2 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 following details:
 - Name
 - Folder
 - Dimension
 - Currency
 - Status
3. Click Search. Only rules that match the search criteria are displayed.

24.3 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 Searching for Rules section.
3. Click in the Action column and select View/Edit to open the rule you want to update.
4. Update the rule details.
 - If model is Confirmed, then only 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.

24.4 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 Searching 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.

24.5 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.

24.6 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 Searching for Rules section.
3. Click in the Action column and select Dependency Check to the rule that you want to check for.

Non-Maturity Products Data Creation Process

Non-Maturity Modeling is comprised of three type 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)

The Data Creation Process allows you to perform the following tasks:

- Defining the portfolio and 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. System is built in such a way that it can display hierarchies based on selected product dimension in Application Preferences
- Process Train is given at 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 [Searching for Rules](#) section
- Viewing and Updating Data Creation processes. For more information, see the [Viewing and Editing Rules](#) section.
- Copying Data Creation processes. For more information, see the [Copying Rules](#) section.
- Deleting Data Creation processes. For more information, see the [Deleting Rules](#) section.
- [Executing Process](#)

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.

The Data Creation Process Summary window displays the following columns.

Table 25-1 Data Creation Process Rule – Fields and Descriptions

Column	Description
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.

Table 25-2 Data Creation Process Rule – Icons and Descriptions

Fields	Description
--------	-------------

Table 25-2 (Cont.) Data Creation Process Rule – Icons and Descriptions

Add	Click Add icon from Top right corner to create a new Data Creation Process Rule.
Delete	Click Delete icon from Top right corner to delete the Data Creation Process Rule.
Refresh	Click Delete icon from Top right corner to refresh the Data Creation Process Rule.
View	Click in the Action column and select View to view the contents of a Data Creation Process rule in read mode.
Edit	Click in the Action column and select 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.

25.1 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 25-1 Create Data Creation Process

3. Enter the details shown in the following table.

Table 25-3 List of process details used for Creating Data Creation Process

Parameter	Description
-----------	-------------

Table 25-3 (Cont.) List of process details used for Creating Data Creation Process

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. The maximum limit of this field is 300 characters. You can enter special characters in this field.
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.

- Click **Apply** to navigate to the **Product Selection** section.

Figure 25-2 Product Selection Section

- Enter the Portfolio Selection details shown in the following table.

Table 25-4 List of Product Selection details used for Creating Data Creation Process

Parameter	Description
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 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.

- Click **Apply** to navigate to the **Parameters** section.

Figure 25-3 Parameters Section.

7. Enter the Parameters as shown in the following table.

Table 25-5 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.

Table 25-5 (Cont.) List of Parameters details used for Creating Data Creation Process

Market Rate Definition	<p>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.</p> <ul style="list-style-type: none"> • Currency: This will list down all the currencies for which 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. User 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, user can choose one term point, 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 percentage format. Enter the spread in percentage on top of rate picked from selected IRC and term point. • IRC Effective Date : Rates will be picked as per the IRC effective date selected on one of following options: <ul style="list-style-type: none"> – 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 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 Historical Term field will be enabled to enter term and tenor.
------------------------	--

8. Click **Apply** and navigate to the **Review Proce**s 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**.

25.2 Executing Data Creation Process

The **Execute** option will run the Data Creation Request and create data as for the selected portfolio.

Prerequisites

Predefined Data Creation Process

Procedure

Following two approaches are available to execute the process:

- [UI Based Procedure](#)
- [Batch Based Procedure](#)

25.2.1 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 **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.

25.2.2 Batch Based Procedure

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 25-4 Task Details section

Task Definition

Task ID: Description:

Components:

Dynamic Parameters List

Property	Value
Datastore Type	<input type="text" value="EDW"/>
Datastore Name	<input type="text" value="ALM812HOME"/>
Primary IP For Runtime Processes	<input type="text" value="whf00jiq"/>
Rule Name	<input type="text" value="Non Maturity Model Batch"/>
Parameter List	<input type="text" value="200114, 'ALMUSER'"/>

5. Define the Task ID and Description.
6. Select Components as **TRANSFORM DATA**.
7. Input the following required parameters:
 - **Datastore Type:** Select appropriate datastore from list
 - **Datastore Name :** Select 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**.

Discount Methods

This module describes the procedure for working with and managing Discount Method rules.

Discount Method rules allow users to define the method for discounting projected cash flows for market value and duration calculation purposes. For each combination of product and currency, you can choose one of the following discount methods:

- Spot Input
- Spot Interest Rate Code
- Forecast Remaining Term
- Forecast Original Term
- Effective Interest Rate

The methodologies contained in the Discount Method rules are referenced by the Static Deterministic and Dynamic Deterministic ALM Processes.

The procedure for working with and managing Discount Method rules is similar to that of other Asset Liability Management business rules.

As part of creating and editing Discount Method rules, you assign Discounting methodologies to applicable products.

**Note:**

Oracle Asset Liability Management provides you with the option to copy, in total or selectively, the product assumptions contained within ALM 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

Topics

- [Creating Discount Method Rules](#)
- [Defining Discount Method Rules](#)

26.1 Creating Discount Method Rules

You create a Discount Methods rule to assign Discounting Methods to your products.

1. Navigate to the Discount Methods rule summary page.
2. Complete standard steps for this procedure.

 **Note:**

In addition to the standard steps for creating rules, the procedure for creating a Discount Methods 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 inheritance of methodologies from parent nodes to child nodes.

26.2 Defining Discount Method Rules

The definition of a Discount Methods rule is part of the Create or Edit Discount Methods rule process. When you click Save in the Create Discount Methods rule process, the rule is saved and the Discount Methods rule summary page is displayed. However, Discount Method assumptions have not yet been defined for any of your products at this point. Typically, you would start defining your Discount Method assumptions for product-currency combinations before clicking Save.

Defining Discount Methods 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.

Prerequisites

Performing basic steps for creating or editing a Discount Methods rule

Procedure

From the Assumption Browser screen, select the product(s) and the currency for which you want to define a discount method(s) and select the “Add New” button to launch the Discount Method Details screen.

 **Note:**

Using the default currency to setup 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 a currency specific discount curve for discounting instruments within each specific base currency. The Default Currency option, if used will apply a selected Interest Rate Code across all currencies.

26.2.1 Discount Method

Select a method from the Discount Method list:

- Spot Input
- Spot Interest Rate Code
- Forecast (Original Term)
- Forecast (Remaining Term)
- Effective Interest Rate

The following table describes the methods and rate choices:

Table 26-1 List of Discount Methods

Method	Single Rate	Yield Curve
Spot Input	Discounts all cash flows by the Input Rate	Not applicable
Spot Interest Rate Code	Not applicable	Discounts each cash flow period by the equivalent term rate on the base yield curve chosen (the yield curve as of the start date selected in your ALM Application Preferences). The term is defined by the remaining term of the cash flow. Refer Note
Forecast (Original Term)	Not applicable	Discounts each cash flow period by the forecasted value of the point on the yield curve corresponding to each transaction record's original term. Refer Note
Forecast (Remaining Term)	Not applicable	Discounts each cash flow period by the forecasted value of the point on the yield curve corresponding to the remaining term until each cash flow. Refer Note
Effective Interest Rate	Discounts all cash flows by Effective Interest Rate from instrument column "EFF_INTEREST_RATE_C"	Not applicable

 **Note:**

In the case of Spot Interest Rate Code, if term point is not available, engine will use linear interpolation to determine the interest rate to discount cashflows.

When Discounting method of Forecast (Original Term) and Forecast (Remaining Term) is used, if term point is not available, engine will use Interpolation method defined for Interest rate code within Forecast rate rule. If Interpolation method defined in Forecast rate rule is Linear, engine will use linear interpolation. If Interpolation method is cubic, engine will use Cubic interpolation to determine interest rate to discount cashflows.

26.2.2 Cash Flow Definition Details

The Cash Flow Definition Details section is used in unique instances to specify the portion of the cash flow that is used to calculate a market value. Select from the following:

- Interest Only - ignores all principal runoff for market value purposes. Use this option for off-balance sheet items where principal is equal to notional principal, and is therefore not a true cash flow.
- Principal & Interest - calculates principal and interest both for market value purposes.
- Ignore Origination Cash Flows for Forward-Starting Instruments – This feature allows the cash flow engine to ignore the origination principal cash flows of any forward-starting instrument. The corresponding market value, duration, convexity and yield calculations will not reflect the origination amount. Origination principal cash flow will still be reported.
- Use Principal in Market Value Calculations (Off-Balance Sheet Only) – This feature allows the cash flow engine to consider principal in the calculation of market value, duration, convexity and yield calculations, even if principal is not actually exchanged.
- Mature at Repricing - calculates a market value and YTM for a given transaction up to the repricing date. For market value and YTM purposes the transaction is assumed to mature on the repricing date. Duration is always calculated to the next reprice date, not to maturity, regardless of the mature at repricing selection

26.2.3 Cash Flow Interest Type

The Cash Flow Interest Type determines which interest component is included in the cash flow definition. The Cash Flow Interest Type can be one of three values:

- Net Rate
- Gross Rate
- Transfer Rate

For typical processing, you will use the Net Rate for the interest component of the cash flow. Special processing objectives, such as valuation of the funding center, may require you to use the other cash flow interest types

26.3 Interest Rate Parameters

One of the following interest rate parameters is available depending on which discount method you select:

- Input Rate - available when you select Spot Input. Type the rate you want to use for market value calculations.
- Rate Spread - available when you select Spot Interest Rate Code, Forecast (Original Term) and Forecast (Remaining Term). Type the percentage difference (+ or -) between the selected rate index and the value you want to use for the discount rate(s) within market value calculations

26.4 Defining a Discount Methods Rule Using Spot IRC: An Example

Define a Discount Methods rule for Total Loans using the spot IRC method.

1. From the Assumption Browser, select Currency (US Dollar) and Total Loans.
2. Select **Add New** to enter the Assumption Details page.
3. From the Discount Method list, select Spot IRC.
4. From Interest Rate Code list, select an appropriate Interest Rate Code.
5. The list of Interest Rate Codes depends on the selected currency. If the selected currency is the default currency, all Interest Rate Codes appear. For other currency selections, the list of interest rate codes includes only interest rate codes whose reference currency is the same as the selected currency.
6. Input a Rate Spread, type 1.0000.
7. A spread of 1% returns a discount rate of 1.00% above the reference interest rate. Type a negative number for a spread below the reference interest rate.
8. From Cash Flow Interest Type, select Net Rate.
9. Under Cash Flow Definition Details, use the default – Principal & Interest selection.
10. 8. Select Apply to commit the assumption and return to the Assumption Browser page.

 **Note:**

You can select more than one product at a time from the Assumption Browser page. After applying assumptions and returning to the Assumption Browser, that all of the children listed below the parent member have “inherited” the Spot IRC assumption.

11. When Discount Method assumptions are defined for all required product / currency combinations, select SAVE from the Assumption Browser page.

26.5 Discount Rate Method Examples

The following examples assume the interest rate has a format of zero coupon yield with annual compounding. The instrument used in each example is an annual-pay, 2-year instrument originated on the `as_of_date`. See the Oracle Financial Services Cash Flow Engine Reference Guide for details on discount factor derivation used in cash flow calculations.

Spot Input

In the Spot Input method, the discount factor does not vary with Forecast Rate - interest rate scenarios. The discount factor calculations assume the input interest rate to reflect a format of zero coupon yield, annual compounding, and actual/actual accrual basis.

Spot Input Rate = 6.00%

The formula for the market value of the account, for any rate scenario, is:

Market Value = Cash Flow1/ (1 + 0.06) + Cash Flow 2 / ((1 + 0.06)^2)

Cash Flow1 is the cash flow at the end of year 1. Cash Flow2 is the cash flow at the end of year 2.

Spot Interest Rate Code

In the Spot Interest Rate Code method, the discount factor depends on the term of the cash flow, but does not vary with interest rate scenario.

Interest Rate Code = Treasury Yield Curve

The formula for the market value of the account, for any rate scenario, is:

Market Value = Cash Flow1/ (1 + 1 Year Treasury) + Cash Flow2/ ((1 + 2 Year Treasury)^2)

Cash Flow1 is the cash flow at the end of year 1. Cash Flow2 is the cash flow at the end of year 2. The values for 1 Year Treasury and 2 Year Treasury reflect the values from the historical interest rate data, beginning with the `as_of_date`.

Forecast Remaining Term

The Forecast Remaining Term method uses forecasted interest rate data to determine the discount factor.

Interest Rate Code = Treasury Yield Curve

The formula for the market value of this account is:

Market Value = Cash Flow1/ (1+ 1Year Treasury Rate at the 1 year point in the forecast) + Cash Flow2/ ((1+ 2 Year Treasury Rate at the 2 year point in the forecast)^2)

Cash Flow1 is the cash flow at the end of year 1. Cash Flow2 is the cash flow at the end of year 2. The values for 1 Year Treasury and 2 Year Treasury reflect the scenario specific values from the forecast rates - interest rate data. Cash Flow1 is discounted at the 1 year Treasury rate, from the 1 year point of the forecast and Cash Flow2 is discounted at the 2 year Treasury rate, from the 2 year point of the forecast.

Forecast Original Term

The Forecast Original Term method uses the forecasted interest rate data to determine the discount factor.

Interest Rate Code = Treasury Yield Curve

The formula for the market value of the account is:

Market Value = Cash Flow1/ (1+ 2 Year Treasury Rate at the 1 year point in the forecast) + Cash Flow2/ ((1+ 2 Year Treasury Rate at the 2 year point in the forecast)^2)

Cash Flow1 is the cash flow at the end of year 1. Cash Flow2 is the cash flow at the end of year 2. Note that Cash Flow1 is discounted at the 2 year Treasury rate. The 2 Year rate is used with this method, because the Forecast Original Term method always uses the term equivalent to the original term of the instrument.

Effective Interest Rate

In the Effective Interest Rate method, the discount rate is derived from instrument column "EFF_INTEREST_RATE_C". As this column is available at record level, discount rate attributed to each record can be different. If User is using this method, User needs to ensure that this column is calculate and populated.

As this is available at record level, same data would be used for all scenarios. The discount factor calculations assume the input data to reflect a format of zero coupon yield, annual compounding, and actual/actual accrual basis.

Effective Interest Rate for associated record = 6.00%

The formula for the market value of the account, for any rate scenario, is: Market Value = Cash Flow1/ (1 + 0.06) + Cash Flow 2 / ((1 + 0.06)^2)

Cash Flow1 is the cash flow at the end of year 1. Cash Flow2 is the cash flow at the end of year 2.

Note: If EFF_INTEREST_RATE_C column does not have any value or if it is null, then Discount Rate passed for calculation = 0%.

Rate Dependency Patterns

This chapter describes the procedure for working with and managing Rate Dependency Patterns.

Rate Dependency Patterns allow you to set up relationships between the level of Interest Rates, Economic Indicators, or Rate Spreads and ALM forecast assumption rules. After defining Rate Dependency Patterns, you can attach these patterns to ALM forecast business rules. ALM assumption rules with Rate Dependency Patterns, work together with your Forecast Rate scenarios to determine assumptions applicable to each specific scenario within your simulation. The following rule types support Rate Dependent assumptions:

- Forecast Balances
- Forecast Maturity Mix
- Forecast Pricing Margins
- Transaction Strategies
- Formula Results

When **Rate Dependency Patterns** are attached to an ALM business rule, you will be able to input multiple versions of each assumption type within a single assumption rule. The ALM engine dynamically retrieves the assumptions which apply to the scenario being processed.

The procedure for working with and managing **Rate Dependency Patterns** is similar to that of other Asset Liability Management business rules. It includes the following steps:

- Searching for Rate Dependency Patterns. For more information, see the [Searching for Rules](#) section.
- Creating Rate Dependency Patterns. For more information, see the [Creating Rules](#) section.
- Viewing and Editing Rate Dependency Patterns. For more information, see the [Viewing and Editing Rules](#) section.
- Copying Rate Dependency Patterns. For more information, see the [Copying Rules](#) section.
- Deleting Rate Dependency Patterns. For more information, see the [Deleting Rules](#) section.

27.1 Searching for Rate Dependency Patterns

Search for a Rate Dependency Pattern to perform any of the following tasks:

- View
- Edit
- Copy
- Delete
- Check Dependencies

Prerequisites

Predefined rate dependency patterns

Figure 27-1 Rate Dependency Pattern Summary Page

Rate Dependency Pattern As of Date: 03/31/2022

Search

Name Folder ALMSEGE

Rate Dependency Pattern

<input type="checkbox"/>	Name	Creation Date	Created By	Last Modification Date	Last Modified By	Access Type
<input type="checkbox"/>	new	12/06/2022 07:38:13	ALMADMIN	12/06/2022 07:38:13	ALMADMIN	Read/Write

1. Navigate to the **Rate Dependency Pattern Summary** page. This page is the gateway to all rate dependency patterns and related functionality. You can navigate to other pages relating to rate dependency patterns from this page.
2. Enter the search criteria.
3. Enter the **Code** or **Name** of the Pattern.
4. Click **Search**.
Only patterns that match the search criteria are displayed.



Note:

You can control the number of rows to display on the window by selecting the **Pagination Options** from the action bar

27.2 Creating Rate Dependency Patterns

You can create Rate Dependency Patterns to attach to forecast business rules. Follow these steps:

1. Navigate to the **Rate Dependency Pattern Rule Summary** page.
2. Enter a **Name** and a brief description of the pattern.
Select the **Folder** and **Access Type**.
3. Select the Rate Dependency Pattern Type from Rate Dependency Pattern Type:
Rate-Level Dependent, **Rate-Spread Dependent**, or **Economic Indicator Dependent**.

Figure 27-2 Rate Dependency Pattern Page to Create a New Rate Dependency Pattern Rule

The selection of the Rate Dependency Pattern type determines the information you must provide to successfully define that pattern type. See:

- [Defining Rate-Level Dependent Rate Dependency Patterns](#)
- [Defining Rate-Spread Dependent Rate Dependency Patterns](#)
- [Defining Economic Indicator Dependent Rate Dependency Patterns](#)


27.2.1 Defining Rate-Level Dependent Rate Dependency Patterns

The **Rate-Level Dependent Relationship** allows you to define assumptions for different values of a single indicator interest rate. The indicator interest rate, referred to as the Base Interest Rate, is defined by an Interest Rate Code, a term selection, and a rate lag.

Figure 27-3 Base Rate Tab of the Rate Dependency Pattern Rule after selecting Rate-Level Dependent option

Table 27-1 Form Fields of Base Rate to Create a New Rate-Level Dependent Rate Dependency Pattern Rule

Base Rate Tab	
Interest Rate Code	The Interest Rate Code identifies the reference yield curve or rate index whose forecasted value determines the assumptions to reference. You can select the Interest Rate Code from all available interest rate codes, as defined within Rate Management .
Term Selection	If the selected Interest Rate Code is a yield curve, you must also select a term. Your term choices depend on the definition of the Interest Rate Code within Rate Management . Note that the selection automatically defaults to the shortest available term.
Rate Lag	If you want the base interest rate calculation to perform a look back function, you can input a rate lag. The new business assumption lookup uses the forecasted interest rates as of a date within the current modeling bucket less the rate lag. If the timing of the new business is End of Bucket, the Lookup function uses the last day of the bucket less the rate lag. For all other cases, the mid-point of the bucket less the rate lag is used.
Rate Tiers Tab Lookup Method	<p>The lookup method determines which new business assumption is selected from the input values when the forecasted interest rate falls between two rate tiers. There are two methods to choose from:</p> <p>Interpolate: If you select Interpolate, the assumption is an interpolated value, using straight line interpolation, calculated from the assumptions associated with the two nearest interest rate tiers. The interpolation uses a simple straight-line interpolation formula.</p> <p>Range: If you select Range, Oracle ALM selects the new business assumption as the closest assumption associated with the rate tier which is less than or equal to the forecasted interest rate.</p>

 **Note:**
 Range method is always used to interpret maturity mix forecast assumption.

1. Provide the **Base Rate** details. See above Table.
2. Select **Save** to navigate to the **Rate Tiers** tab. After you have selected a rate-level relationship and defined your base interest rate, you must define rate tiers. **Rate Tiers** provide the lookup values for which different assumptions can be input.
3. Select **Add Rows** to add the number of **Rate Tiers** tab to include in your pattern.
4. Input the appropriate Rate Level for each Rate Tier.
5. Select the **Lookup** Method.
6. Select **Save** to complete the definition.

27.2.2 Defining Rate-Spread Dependent Rate Dependency Patterns

With the **Rate-Spread Dependent Relationship**, you can input assumptions for different spreads between two indicator interest rates. You define the first indicator interest rate, the Base Interest Rate, as described previously. The second indicator **Interest Rate**, the **Alternate Interest Rate**, also requires the selection of an **Interest Rate Code**, a **Term Selection**, and a **Rate Lag**.

Figure 27-4 Base Rate Tab of the Rate Dependency Pattern Rule after selecting Rate-Spread Dependent option

The rate spread equals to Alternate Interest Rate - Base Interest Rate

1. Define the **Base Interest Rate** details. See [Table](#).
2. Select **Save**.
3. Define the **Alternate Interest Rate** details. These fields are the same as the **Base Rate** tab.
4. Select **Save**.
5. Define the **Rate Tiers** for the **Spreads**.
6. Select the **Lookup** Method.
7. Select **Save** to complete the definition.

27.2.3 Defining Economic Indicator Dependent Rate Dependency Patterns

With the **Economic Indicator Dependent Relationship**, you can input assumptions for different levels of a selected **Economic Indicator**. The only required selection for this method is the type of **Economic Indicator**. You can select the **Economic Indicator** from all available **Economic Indicators** for the selected **Currency**, as defined within **Rate Management**.

Figure 27-5 Rate Tiers Tab of the Rate Dependency Pattern Rule after selecting Economic Indicator option

The screenshot shows a web-based configuration interface for a Rate Dependency Pattern Rule. At the top, there is a section for 'Rate Dependency Selection' with a dropdown menu set to 'Economic Indicator Dependent'. Below this is a section for 'Economic Indicator Dependency Relationship' with two tabs: 'Base Economic Indicator' and 'Rate Tiers'. The 'Rate Tiers' tab is active, showing a dropdown menu for 'Economic Indicator'. At the bottom right of the interface are two buttons: 'Save' and 'Cancel'.

1. Select the **Economic Indicator**.
2. Select **Save**.
3. Define the **Rate Tiers** for the **Economic Indicators**. See [Table](#).
4. Select the **Lookup** Method.
5. Select **Save** to complete the definition.

Forecast Balance Rules

This module discusses modeling of new business activity through the Forecast Balance rules. Included are assumption setup and processing.

Within a Forecast Balance rule, you specify the amount of new activity generated per modeling bucket on each product within each active currency. To create a new business assumption, you select from eight available forecasting methods. You can further tailor the new business assumptions to meet your expectations of future originations, including the timing of new business and the effect of interest rates on new business amounts.

Topics:

- [Forecasting Methods](#)
- [Rate-Volume Modeling](#)
- [Creating a Forecast Balance Rule](#)
- [Examples of Forecast Balance Assumptions](#)

28.1 Forecasting Methods

The new business methods within the Forecast Balance rule determine how new business assumptions are applied per product leaf within each active currency. They consist of:

For the Target Growth, Target End, and New Add methods, you select one of two timing options to indicate when new business for a new account should be originated. The two options are:

- No New Business
- Target End Balance
- Target Average Balance
- Target Growth Percent
- New Add Balance
- Rollover
- Rollover with New Add
- Rollover with Growth %

For the Target Growth, Target End, and New Add methods, you select one of two timing options to indicate when new business for a new account should be originated. The two options are:

- **Distributed Option:** Solves for the origination date of the new business account to reach an expected average balance, assuming even distribution of new business throughout the modeling bucket. For each modeling bucket, this calculation results in an average balance amount that is midway between the beginning balance and the ending balance.

- **Bucket End Method:** Generates new originations at the end of the modeling bucket. Adding new business at the end of the modeling bucket is effective in terms of processing time, but may result in irregular average balances and interest accruals over the bucket.

For the Target Average method, the system automatically determines the timing of new originations to ensure that the user-input target is achieved. For Rollover business, the system assumes that the rollover occurs at the time of runoff of existing accounts.

 **Note:**

For distributed originations of Target Growth and Target End balances, Transaction Strategies and future origination in the current position may impact the distributed originations calculation. Because the origination date on Transaction Strategy and current position accounts cannot be modified, the timing algorithm may not be able to find an origination date for the remaining new business which achieves the expected average balance.

The application of each new business method, including how different timing options are applied, is described below:

No New Business

No New Business (forecasting zero changes in balances) is the default method for the Forecast Balance rule. This method allows runoff without replacement of the paid-down balances.

Target End Balance

Use the Target End Balance method to define the total expected balance by the end of each modeling bucket. The new origination amount and the timing of originations within each modeling bucket are determined during processing, as described below:

New Origination Amount

The new origination amount per bucket is calculated as:

$$\text{Target Ending Balance} - \text{Beginning Balance} + \text{Total Runoff} - \text{Transaction Strategy Originations} - \text{Current Position Originations}$$

New Business Timing

For the Target End method, you can choose either the At Bucket End timing option or the Distributed timing option.

At Bucket End: The new origination amount is added on the final date in the bucket. Interest starts accruing on the next day, the first date of the next bucket.

Distributed: The new origination amount is added on the calculated date(s) which allow the average balance to equal the beginning balance plus the ending balance divided by two, accounting for timing of runoff and other originations occurring during the modeling bucket.

Target Average Balance

Use the Target Average Balance method to define the expected average balance per modeling bucket. The new origination amount and the timing of originations within each modeling bucket are determined during processing, as described below:

New Origination Amount

The new origination amount per bucket is calculated as:

$2 * (\text{Target Average Balance} - \text{Bucket Beginning Balance}) + \text{Total Runoff} - \text{Transaction Strategies Originations} - \text{Current Position Originations}$

New Business Timing

The new origination amount is added on the calculated date(s) which allow the average balance to equal the user-input target average. This calculation accounts for timing of runoff and other originations occurring during the modeling bucket.

Note:

Here, Target Average formula is a general use statement that helps users to understand how Target Average Balance calculations are made and to validate output. Given the complexities of formula inputs, external detail calculation results may vary.

When you are using Target Average, it is recommend that only Target Average Balance is reported as other financial elements may fluctuate widely to achieve average targets from period to period.

Target Growth Percent

Use the Target Growth Percent method to define the expected percentage change in the balance over each modeling bucket, expressed as a percent of the bucket's initial balance. Target Growth can be used to model flat balance sheet by assuming a growth rate of 0%. This method can be set at the node level and inherited to leaf level,* making setup and maintenance efficient. The method does work on products that have no current business and will return 0 (zero) new business, but it is highly advised that you align the forecast balances to products that do have current business, so as not to cause unnecessary processing time. There is no restriction in the number of product/currency combinations that OFSAA can process. However, the duration of the process will increase depending on the number of product/currency combinations.

Note:

This is the only forecast balance method that allows inheritance.

The new origination amount and the timing of origination are determined during processing, as described below:

New Origination Amount

The new origination amount per bucket is calculated as:

(Beginning Balance * Target Growth Percent + Total runoff – Transaction Strategy Originations - Current Position Originations) for bucket end option, and,

(Beginning Balance * Target Growth Percent + Total Runoff - Transaction Strategy Originations - Current Position Originations) for distributed option

New Business Timing

For the Target Growth method, you can choose either the At Bucket End timing option or the Distributed Originations timing option.

At Bucket End: The new origination amount is added on the final date in the bucket. Interest starts accruing on the next day, the first date of the next bucket.

Distributed: The new origination amount is added on the calculated date(s) which allow the average balance to equal the beginning balance plus the ending balance divided by two. This calculation accounts for timing of runoff and other originations occurring during the modeling bucket.

New Add Balance

The New Add Balance method defines the absolute amount of new business that is added within a bucket. The new origination amount and the timing of origination are determined during processing, as described below:

New Origination Amount

The new origination amount is equal to the user-input new add balance.

New Business Timing

For the New Add method, you can choose either the At Bucket End timing option or the Distributed Originations timing option.

At Bucket End: The new origination amount is added on the final date in the bucket. Interest starts accruing on the next day, the first date of the next bucket.

Distributed: The new origination amount is added at the mid-point of the modeling bucket. If the modeling bucket contains an uneven number of days, the origination is apportioned evenly over the two days in the middle of the bucket.

Rollover

Use the Rollover method to base the amount of new business on the rollover (reinvestment of principal on a given or like products) of existing business. You can roll any combination of prepayments, maturing balances, and principal runoff from a product into itself or into another product. For multiple currency processing, rollover processing occurs within each individual currency. Rollover cannot occur between two currencies. The new origination amount into a particular target leaf member and the timing of that origination are described below.

New Origination Amount

For a single target leaf member within a single currency, the new origination amount depends on the rollover sources, which are product leaves of the same currency whose runoff drives the amount of new business generated into the target leaf member. For each rollover source, you must also define the components of principal runoff you would like to roll over. Your choices are:

- **Total:** Total runoff includes runoff from all three categories of run-off: scheduled principal payments, prepayments, and maturing balances.

- **Prepay:** Prepay includes runoff from prepayments, early repayment of principal balances.
- **Maturity:** Maturity incorporates payment of principal on the maturity date, above that incorporated in the scheduled principal payment. Balloon payments and final principal repayment of non-amortizing instruments are included in this category.
- **Payment:** Payment runoff includes scheduled principal payment on an amortizing instrument.

For each combination of source leaf and runoff type, you can input a different rollover percent. The new origination amount within a modeling bucket equals the runoff amounts multiplied by the percentage rollover for all source leaves.

Timing of Rollover

All runoff from sources are added as new business into the target leaf with the proper currency at the average time of runoff.

The average time of runoff is calculated by taking an average of the runoff date weighted by the amount of runoff for all instruments which make principal payments during the modeling bucket.



Note:

Rollover of runoff components, prepayment, payment, or maturity requires that those components exist in the output data set. In a Dynamic Deterministic Process rule, you must select those financial elements from the Calculation Elements block. Otherwise, no new business is generated from those runoff components.

Rollover with New Add

Use the Rollover with New Add method to apply both rollover assumptions and new add assumptions to a single product within a single currency. It allows new business to be driven by reinvestment of existing accounts plus an expectation of new business amounts. The New Add method and the rollover method are applied independently, with the New Add applied first.

Rollover with Growth Percent

Use the Rollover with Growth Percent method to apply both rollover assumptions and an overall Growth Percent assumption to a single product within a single currency. It allows new business to be driven by reinvestment of existing accounts plus an expectation around growth percentage. Growth Percent defined in Target Growth, determines overall growth of product, including rollovers.

Rollover assumption is applied first and is calculated independently on Runoff type selected in rule. To determine Rollover Runoff, see the [Rollover](#). New business via Target Growth is calculated thereafter, and is calculated as

(Beginning Balance * Target Growth Percent + Total runoff - Transaction Strategy Originations - Current Position Originations - Rollover New Business).

For more information on Target Growth, see the [Target Growth Percent](#).

Account Types and New Business

The availability of a new business method depends on the account type of the product leaf member. The account type of a product leaf comes from its associated Common COA attribute. Setup requirements for each of the account types are described below:

- Interest Bearing Accounts:
- Earning asset
- Interest bearing liability
- Off balance sheet receivable
- Off balance sheet payable

Income Statement Accounts: The only method available is New Add. For these accounts, input the desired income statement value for each bucket. The following account types are classified as income statement:

- Non-interest income
- Non-interest expense
- Interest income
- Interest expense

Balance Sheet Accounts: The only method available is New Add. For balance sheet accounts, the input amount is interpreted as a balance. The following account types are classified as balance sheet:

- Other asset
- Other liability
- Equity

28.2 Rate-Volume Modeling

Customer demand for new products often depends on interest rates (either the absolute level of interest rates or the spread between two rate indices) or other variables such as macro-economic drivers. You can model this behavior by selecting a rate-volume assumption. Once you have selected the rate-volume assumption, you must incorporate additional parameters through selection of a Rate Dependency Pattern, which control how interest rates or economic variables affect new business levels.

Rate-Volume Assumptions

There are four rate-volume options to choose from:

- **No Relationship**

If you want new business amounts to stay constant regardless to the interest rate environments, select this option.

- **Rate-Level Dependent**

The Rate-Level dependent relationship allows you to change new business behavior for different values of a single indicator interest rate. The indicator interest rate, referred to as the Base Interest Rate, is defined by an Interest Rate Code, a term selection, and a rate lag.

Interest Rate Code: The Interest Rate Code identifies the reference yield curve or rate index whose forecasted value determines the new business amount. You can

select the Interest Rate Code from all available interest rate codes for the selected currency, as defined within Rate Management. The list of Interest Rate Codes includes only codes with a reference currency equivalent to the currency selected in the Floating Tree Bar.

Term Selection: If the selected Interest Rate Code is a yield curve, you must also select a term. Your term choices depend on the definition of the Interest Rate Code within Rate Management. Note that the selection automatically defaults to the shortest available term.

Rate Lag: If you want the base interest rate calculation to perform a look back function, you can input a rate lag. The new business assumption lookup uses the forecasted interest rates as of a date within the current modeling bucket less the rate lag.

If the timing of new business is End of Bucket, the lookup function uses the last day of the modeling bucket less the rate lag. For all other cases, the mid-point of the bucket less the rate lag is used.

- **Rate-Spread Dependent**

With the Rate-Spread dependent relationship, you can input new business assumptions for different spreads between two indicator interest rates, or a spread between two term points on the same yield curve. You define the first indicator interest rate, the Base Interest Rate, as described previously. The second indicator interest rate, the Alternate Interest Rate, also requires definition of an Interest Rate Code, a term selection, and a rate lag.

The rate spread equals the Alternate Interest Rate minus the Base Interest Rate.

- **Economic Indicator Dependent**

With the Economic Indicator Dependent relationship, you can input new business assumptions related to defined economic indices (as defined in Rate Management), where the change in the index will drive a different outcome of new business. For example, you can forecast a higher GDP and tie the new business assumptions to that particular forecast.

Rate Tiers

The Rate Tiers tab will become available to edit when one of the following three rate volume relationships have been selected (Rate Level, Rate Spread, and Economic Indicator). Once you have selected a rate-volume relationship and defined your base and alternate interest rates, you must define rate tiers. Rate tiers provide the lookup values for which different new business assumptions can be input.

Lookup Method

The lookup method determines which new business assumption is selected from the input values when the forecasted interest rate falls between two rate tiers.

There are two methods to choose from:

Interpolate:

Range: If you select Range, Oracle ALM selects the new business assumption as the closest assumption associated with the rate tier which is less than or equal to the forecasted interest rate

28.3 Creating a Forecast Balance Rule

To create a new Forecast Balance rule, complete the following steps:

1. Click the **Add** on the **Forecast Balances** summary page to add a new rule.
2. Enter a descriptive name for the rule.
3. Enter a description (optional).
4. Select a folder.
5. Select Product Hierarchy folder.
6. Select Product Hierarchy
7. Select Currency
8. Drill down to desired leaf level node(s) in the Assumption Browser
9. Click **Save**

When saved, go back to edit the Forecast Balance rule just created. Check the box next to the description and click the **Edit** icon.

The Forecast Balance rule dialog opens on the Method tab. The other tabs (Rate Tiers, New Volume detail, Roll-over Set up and Detail) are dependent upon method chosen and the rate volume relationship. You must begin the assumption setup on the Method Tab and work your way through the remaining tabs, as needed. To input new assumptions for a particular product leaf and currency, follow the steps detailed under each Tab heading, described next:

Method Tab

The Method Page is used to define the Forecast Balance method per product leaf and currency. On this page you define the New Business method, the timing option, and the type of rate-volume relationship.

Follow the steps listed below to complete this information.

1. Select a product leaf from the drop-down list under the Product and Currency Details (in this case, Commercial Loans fixed).
2. Select preferred New Business Method. If you select Target End, Target Growth, New Add, or any combined rollover option, note that the Timing selection is enabled.
3. Select preferred Timing option (with Target End, Target Growth, New Add, Rollover with Growth % and Rollover with New Add only).
4. Select the type of Rate-Volume Relationship you want to model. If the relationship is Rate Spread, Rate Level, or Economic Indicator, the Rate Tiers tab is enabled.

Rate Tiers Tab

On the Rate Tiers tab the Rate Dependency Pattern drop-down list appears. Select the desired name you defined in the Rate Dependency Patterns user interface. If you have selected No Relationship on the Method Page, this page is not accessible.

You can see the defaulted values for the Base Rate and the Rate Tier Bars appear as input in, when the pattern was defined.

New Volume Detail Tab

The **New Volume Detail** Page is used to input new volume assumptions for the methods:

- New Add

- Target End
- Target Average
- Target Growth
- New Add component of the Rollover with New Add method
- Growth % component of the Rollover with Growth % method

On this page, you select the range of modeling buckets and input balance or percentage assumptions for each modeling bucket within this bucket range. An example of the **New Volume Detail** page appears as shown in the following figure:

1. Select the **New Volume Detail** tab.
2. Select the modeling bucket start and end range. The default Bucket Range includes all modeling buckets. To forecast new business in a subset of the modeling horizon, reduce the bucket range by increasing the bucket start date or decreasing the bucket end date. As you change the bucket start and/or the bucket end, the view adjusts accordingly to display only buckets within the selected range.
3. Select corresponding row to the first modeling bucket. If rate-volume relationships are used, this cell also corresponds to the first rate tier. Input the targeted value. For New Add, Target End, and Target average, input an amount. For Target Growth, input a percent. The percent should represent the percentage growth within the modeling bucket. It should not represent an annualized amount.
4. You can also use the **Excel import/export** feature to add the New Volume Detail information.

Rollover Setup and Details Tab

In the Rollover Setup and Details tab, first input the setup details necessary for definition of rollover percentages (source product leaves and bucket ranges), second, input rollover percentages. The rollover percentages represent the percent of the runoff amount from the source (leaf and runoff type for the selected currency) which generates new business into the target leaf for the selected currency.

1. Click the Rollover Setup and Details tab to display the page.
2. Click the **Add** icon to select the Product Runoff Type Selection.
3. The Hierarchy page will appear. Select the product leaf members for the rollover and click **Ok**.
4. The selected products will appear below the Product Runoff Type selection bar.
5. Choose the desired runoff type (Total, Prepay, Maturity, Payment, Core, Volatile, Devolvement, Recovery, or NPA).
6. Define the input bucket ranges. You only need to define multiple bucket ranges if you want to vary rollover assumptions by modeling buckets. The bucket ranges defined here only apply to rollover occurring from the source leaf to the target leaf. You must have at least one bucket range defined. Typically, you define a bucket range from the first modeling bucket to the last modeling bucket, covering the entire modeling horizon. To define a bucket range, complete the following steps:
 - a. Select a start bucket date for the first date range.
 - b. Select an end bucket date for the first date range.
 - c. Select Add to add a bucket range which begins on the first date of the start bucket and ends on the last date of the end bucket.

- d. Select a new start date for the next date range. You can select from any buckets that are not encompassed by a defined bucket range. Modeling buckets which are a part of an existing bucket range do not appear in this list.
 - e. Select an end date for the next date range. You cannot create overlapping modeling buckets. To prevent this, the list of available bucket end dates only includes modeling buckets which follow consecutively from the selected start bucket.
 - f. Continue adding bucket ranges until all desired ranges have been defined.
 - g. Once all desired products and bucket ranges are selected and defined, click **Apply**.
7. The Rollover Bucket Range Details form will appear at the bottom. To define the details for the above prescribed bucket ranges, do the following:
- a. Select a bucket from the drop-down list of defined bucket ranges.

 **Note:**

The defaulted values for runoff type are populated.

- b. Enter the percentage rollover for the given products.
- c. You can also use the **Excel Import/Export** feature to add the Rollover Bucket Range Detail information.
- d. Click **Apply**.

28.4 Editing the Defined Forecast Balance

You can modify or edit an existing forecast balance by opening it, making the changes and then saving it as either a:

- Different Method with a new name, or
- The same forecast balance name

Naming Convention:

It is best to use a naming convention that creates different groups of forecast balances. This keeps track of which methods were created, in the context of specific modeling buckets.

The Active Time Bucket Rules:

Assumptions that you define when creating a forecast balance are based on a specific modeling horizon, which is defined in the Time Buckets section.

Example

- If you define a forecast balance based on a Time Bucket with a monthly modeling horizon, your results are calculated in monthly time periods.
- If you redefine that same forecast balance, using a different time bucket with a weekly modeling horizon, your results are calculated in weekly time periods.

If assumptions in your Forecast Balance are based on a modeling horizon that is different from the horizon defined in the active time bucket, inaccurate data will result. You should verify that date-sensitive rules are consistent with the active Time Bucket.

Defining Forecast Balances 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.



Note:

The only method supported for inheritance is Target Growth.

28.5 Examples of Forecast Balance Assumptions

Below are two examples describing how to input assumptions into the Forecast Balance for a product using the target growth method and a product using the rollover capabilities.

Target Growth Example

The following example describes how to model the effect of interest rate changes on growth in a loan product. We will input values that cause the growth rate of loans to decrease as interest rates increase.

1. Create a new Forecast Balance rule.
2. Select US dollars in the Currency Selection.
3. Select the desired product leaf from the product list.
4. Click the **Add** icon to add new forecast balance rules.
5. Select Target Growth as the New Business method.
6. Select Distributed as the Timing option.
7. Select Rate-level dependent as the Rate-Volume relationship.
8. Click the **Rate Tiers** Tab.
9. Select a Rate Dependency Pattern from the drop-down list.
10. Click the **New Volume Detail** Tab. The two lookup methods for 1% and 4% will appear in the columns, next to each bucket. Enter 8% growth for a 1% 3 year rate environment, and 2% growth for a 4% 3 year rate environment.

28.5.1 Rate Sensitive Rollover Example

This example shows how to input rollover behavior for a product where as the yield curve steepens, holders of shorter term products increasingly choose to roll into another longer term product (for example, CD investors).

1. Create a new Forecast Balance rule.

2. Select US dollars in the Currency selection.
3. Select the desired product leaf from the product list.
4. Click the **Add** icon to add new forecast balance rules.
5. Select the New Business method Rollover.
6. Define the Rate-Volume relationship as Rate-Spread Dependent.
7. Click the **Rate Tiers** Tab.
8. Select the desired rate dependency pattern.
9. Click the Rollover Setup and details tab.
10. Click the Add icon to add desired products in Product Runoff Type Selection. Choose Total, Prepay, Maturity, or Prepayment runoff.
11. Define the bucket range. (In this case the entire bucket range). Click “Add” to create the range.
12. Click Apply. The rollover Bucket Details Bar will appear at the bottom of the page.
13. Input the desired rollover for each rate spread scenario. In this case it is the steepening spread between 6 month and 5 yr Libor curve points.
14. Click **Apply**.

28.5.2 Processing New Business in a Dynamic ALM Process

To process the assumptions you have input, the Forecast Balance rule must be selected in a Dynamic Deterministic or Dynamic Stochastic ALM Processing Rule. The output process selections defined within the Output Preferences block Process rule of , determine which forecast balance assumptions per currency are used. If processing output is product-only, forecast balance assumptions for the reporting currency are processed. New business assumptions for all other currencies are ignored. If the output is product and currency, forecast balance assumptions for each product and currency combination are processed. See ALM Processing for more information on processing.

Forecast - Pricing Margins

The Pricing Margin Rules allow users to define pricing margins (or spreads) for your 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 Forecast Balance Rules. New business assumptions are defined based on the combined inputs from the following four forecast related business Rules:

- Product Characteristics
- Forecast Balance Rules
- 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.

The procedure for working with and managing Pricing Margin Rules is similar to that of other Oracle Asset Liability Management Business Rules. It includes the following steps:

- Searching for Pricing Margin rules. For more information, see [Searching for Rules](#) section.
- Creating Pricing Margin Rules. For more information, see the [Creating Rules](#) section.
- Viewing and Editing Pricing Margin rules. For more information, see [View and Edit the Rule](#) section.
- Copying Pricing Margin rules. For more information, see [Copy the Rule](#) section.
- Deleting Pricing Margin rules. For more information, see [Delete the Rule](#) section.

29.1 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. For more information, see the [Overview of Common Rule Management Tasks](#) section.

 **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, you need to select a product hierarchy. For more information, see the [Overview of Common Rule Management Tasks](#) section. 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 Asset Liability Management provides you with the option to copy, in total or selectively, the product assumptions contained within ALM 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.

29.2 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. You must start defining your Pricing Margin assumptions for product-currency combinations before clicking **Save**.

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 explicitly defined for a child take precedence over those at the parent level.

Prerequisites

Performing basic steps for creating or editing a Pricing Margins Rule.

Procedure

Defining Pricing Margins has two primary steps:

1. Select **Rate Dependency**.
2. Enter Pricing Margin details for the selected products.

 **Note:**

Using the default currency to setup 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.

3. Select **Rate Dependency**.

- a. Select the **Rate-Dependency Relationships** tab and enter details shown in the following table:

Figure 29-1 Rate Dependency Relationship Tab of Pricing Margin Rule Details page

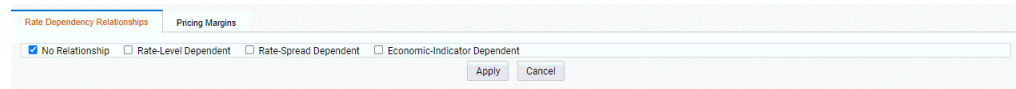


Table 29-1 Form Fields of Rate Dependency Relationship Tab of Pricing Margin Rule Details page

Fields	Description
Rate Dependency Relationships	<p>There are four rate dependency options to select:</p> <ul style="list-style-type: none"> · No Relationship · Rate-Level Dependent · Rate-Spread Dependent · Economic Indicator Dependent <p>If any Rate Dependency option, other than No Relationship, is selected, the Rate-Dependency Pattern drop-down list becomes active. The list of available patterns is limited to those which apply to the selected Rate-Dependency Relationship Type.</p>

- b. Click **Apply**.
4. Enter Pricing Margin details for the selected products
In an Income Simulation scenario, you may want to price a 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 modeling period.
- a. Click **Add Row** to select the number of Maturity Mix Date Ranges that are required during the forecast period. The **Bucket Number** field is used to calculate the **Start** and **End** dates. The Bucket Number field determines which Income Simulation Bucket is used to calculate these dates.

The Pricing Margin Rule uses the modeling period defined in the **Active** Time Bucket Rule. Always verify that your modeling horizon and related assumptions are consistent with the **As of Date** and **Active** Time Bucket Rule before processing.

- b. Enter details as shown in the following table:

Figure 29-2 Pricing Margins Tab of Pricing Margin Rule Details page

Table 29-2 Form Fields of Pricing Margins Tab to Create a New Pricing Margin Rule

Fields	Description
Rate Tiers	Rate Tiers reflect the Rate Dependency Pattern details from the selected Rate Dependency Pattern. 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.
Margin Type	<p>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.</p> <p>If Margin Type is selected as Rate, the provided Margin is used as a fixed spread.</p> <p>If Margin Type is selected as Percent, the Margin must be provided as the Percentage of forecast rate. If the margin is 10% of the forecast rate, 10 must be provided. Margin is calculated as:</p> $\text{Margin} = \text{Margin \%} * \text{Raw Rate}$ <p>For more information, see the Cash Flow Reference Guide.</p> <p>After you change from Rate to Percent, all unsaved margin data will be deleted.</p> <p>A warning message is displayed: <i>All entered value will be lost. Do you want to proceed?</i></p>
Bucket Number	The Bucket Number 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.

Table 29-2 (Cont.) Form Fields of Pricing Margins Tab to Create a New Pricing Margin Rule

Fields	Description
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 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 an instrument will not change as the instrument ages.
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.
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. 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.

29.3 Defining a Pricing Margin Rule: An Example

Define a Pricing Margin Rule using a Rate Dependency Pattern.

1. From the **Pricing Margin Assumption Browser** page, select **Currency** (US Dollar) and a **Product** from the **Hierarchy Browser**.
2. Select **Add New** to enter the **Pricing Margin Assumption Details** page.
3. Select the **Rate-Level Dependent – Rate Dependency** option.
4. Select **Rate Level – Rate Dependency Pattern** from the drop-down 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** to copy the bucket structure across all rate tier pages.
7. Input Rate Spreads for each bucket range that you define.

- a. 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.
 - b. You can also use the **Excel Import/Export** feature to add the Date Buckets/Margins information in the **Pricing Margins** tab.
8. 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 **Pricing Margin Assumption Browser** page.

 **Note:**

You can select more than one product at a time from the **Pricing Margin Assumption Browser** page.

9. When Pricing Margin assumptions are defined for all required product/currency combinations, select **Save** from the **Pricing Margin Assumption Browser** page.

Forecast – Maturity Mix

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 or 30 Year Amortization, 25% - 7 Year Term or 30 Year Amortization, and 50% - 30 Year Term or 30 Year Amortization. You attach the set of maturity assumptions to apply to all new volumes within a Dynamic ALM Process by selecting the appropriate Maturity Mix Rule.

New business assumptions are defined based on the combined inputs from the following four forecast related Business Rules:

- Product Characteristics
- Forecast Balance Rules
- Forecast - Pricing Margins
- Forecast – Maturity Mix

The procedure for working with and managing Maturity Mix Rules is similar to that of other Oracle Asset Liability Management business Rules. It includes the following steps:

- Searching for Maturity Mix rules. For more information, see [Searching for Rules](#) section.
- Creating Maturity Mix Rules. For more information, see the [Creating Rules](#) section.
- Viewing and Editing Maturity Mix rules. For more information, see [View and Edit the Rule](#) section.
- Copying Maturity Mix rules. For more information, see [Copy the Rule](#) section.
- Deleting Maturity Mix rules. For more information, see [Delete the Rule](#) section.

As part of creating and editing Maturity Mix Rules, you must define Maturity Mix assumptions for applicable products.

30.1 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 set up the date range over which these assumptions can be defined.

To create a new Maturity Mix Rule, follow these steps:

1. Navigate to the **Maturity Mix Rule Summary** page.

Figure 30-1 Maturity Mix Rule Summary page

2. Complete standard steps for this procedure. For more information, see the [Overview of Common Rule Management Tasks](#) section.

 **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, you need to select a product hierarchy. For more information, see the [Overview of Common Rule Management Tasks](#) section. 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 Asset Liability Management provides you with the option to copy, in total or selectively, the product assumptions contained within ALM business Rules from one currency to another currency, a set of currencies, from one product to another product, or a set of products.

30.2 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 are not defined for any of your products at this point. You must 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 explicitly defined for a child take precedence over those at the parent level.

Prerequisites

Performing basic steps for creating or editing a Maturity Mix Rule. For more information, see the [Creating Maturity Mix Rules](#) section.

Defining Maturity Mix assumptions involves three primary steps:

1. Select Rate Dependency.
2. Define **Maturity Mix Assumption Bucket** ranges.
3. Enter Maturity Mix assumption details.

Note:

Using the default currency to setup 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.

4. To define a new Maturity Mix Rule, follow these steps
 - a. Select **Rate Dependency**.
 - b. Select the **Rate Dependency Relationships** tab and enter de-tails as shown in the following table.

Figure 30-2 Rate Dependency Relationship Tab of the Maturity Mix Rule

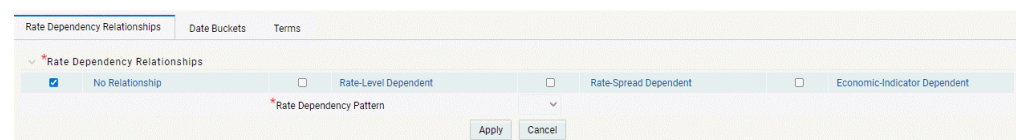


Table 30-1 Fields of Rate Dependency Relationship Tab to Create a New Maturity Mix Rule

Fields	Description
Rate Dependency Relationships	<p>There are four Rate Dependency options to select:</p> <ul style="list-style-type: none"> • No Relationship • Rate-Level Dependent • Rate-Spread Dependent • Economic-Indicator Dependent <p>If any Rate Dependency option other than No Relationship, is selected, the Rate Dependency Pattern drop-down list becomes active. The list of available patterns is limited to those which apply to the selected Rate Dependency Relationship Type.</p>

- c. Click **Apply**.
5. Define Maturity Mix assumption bucket ranges
 - a. Select **Date Buckets** tab. The **Maturity Mix Date Bucket selection** window is displayed.
 - b. Click **Add Row** to select the number of Maturity Mix Date ranges that are required during the forecast period. The **Bucket Number** field is used to calculate the **Start** and **End** dates. The **Bucket Number** field 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. Verify that your modeling horizon and related assumptions are consistent with the **As of Date** and **Active** Time Bucket Rule before processing. Enter details as shown in the following table:

Figure 30-3 Date Buckets Tab of Maturity Mix Rule Details page

The screenshot shows the 'Date Buckets' tab of the Maturity Mix Rule Details page. At the top, there are tabs for 'Rate Dependency Relationships', 'Date Buckets', and 'Terms'. Below the tabs, there is a 'Select Rate Tier' dropdown set to '0'. A table with the following columns is displayed: 'Date Buckets', 'Bucket Number', 'Start Date', 'End Date', and 'Definition Status'. The table contains one row with 'Date Buckets' checked, 'Bucket Number' set to '1', 'Start Date' as '06/26/2014', 'End Date' as '06/25/2014', and 'Definition Status' as a green square. Below the table, there is a checkbox labeled ': Apply Defined Buckets to all Rate Tiers' and a 'Define' button.

Table 30-2 Fields of Date Buckets tab to create a new Maturity Mix Rule

Fields	Description
Rate Tiers	Rate Tiers reflect the Rate Dependency Pattern details from the selected Rate Dependency Pattern. Define Maturity Mix assumptions for each rate tier. The application will automatically determine, using range lookup method, 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 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.

Table 30-2 (Cont.) Fields of Date Buckets tab to create a new Maturity Mix Rule

Fields	Description
Start Date and End Date	<p>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. See Time Buckets for more information. Any new business originated within these dates is modeled using the Maturity Terms defined in the Maturity Mix Rule.</p> <p>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.</p>
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.

- c. Click **Define**.
6. Enter **Maturity Mix Assumption** details.
 - a. Select the **Terms** tab.
This tab allows you to define the Maturity Term details. You can assign one or more Maturity Terms within the details page, but the sum of the percentage weights must be equal to 100%.
 - b. Enter **Attribute** details as shown in the following table:

Figure 30-4 Terms Tab of Maturity Mix Rule Details page

The screenshot shows the 'Terms' tab of the Maturity Mix Rule Details page. It features a table with the following structure:

Terms	Maturity	Multiplier	Amortization	Multiplier	Percent
<input type="checkbox"/>	1	Months	1	Months	100%

Below the table, there is a 'Total Percentage: 100%' indicator and 'Apply' and 'Cancel' buttons.

Table 30-3 Form Fields of Terms Tab to Create a New Maturity Mix Rule

Fields	Description
Maturity	Defines the Maturity Term.

Table 30-3 (Cont.) Form Fields of Terms Tab to Create a New Maturity Mix Rule

Fields	Description
Multiplier	Maturity multiplier (that is, 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 (that is, 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.

- c. Click **Apply**.

30.3 Defining a Maturity Mix Rule: An Example

1. Define a Maturity Mix Rule using a Rate Dependency Pattern.
2. From the **Maturity Mix Assumption Browser**, select **Currency** (US Dollar) and **Product** from the **Hierarchy** browser.
3. Select **Add New** to enter the **Maturity Mix Assumption Details** page.
4. Select **Rate-Level Dependent Rate Dependency**.
5. Select **Rate Level – Rate Dependency Pattern** from the drop-down 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** to copy the bucket structure across all rate tier pages.
8. Select 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. Enter the **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 **Maturity Mix Assumption Browser** page.

 **Note:**

You can select more than one product at a time from the **Maturity Mix Assumption Browser** page.

14. When Maturity Mix assumptions are defined for all required product/currency combinations, select **Save** from the **Maturity Mix Assumption Browser** page.

31

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.

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.

31.1 Creating Transfer Pricing Rules

You create a Transfer Pricing Rule to map Transfer Pricing Methodologies for your products.

To create a Transfer Pricing Rule, from the LHS menu, select **Assumption Specification**, and then select **Transfer Pricing Rules**.

The Transfer Pricing Rules Summary Screen is displayed showing a set of Transfer Pricing Rules. Using search criteria, you can control the set of rules that are displayed. When you Add, Edit, or View a rule, a detailed screen is displayed.

Figure 31-1 Transfer Pricing Rules Summary Screen

Name %	Creation Date %	Created By %	Last Run Date %	Last Run By %	Access Type %	Folder %	Status %	Action %
HR_UA_TC01	29/07/2022 10:36:30	FTP_DAU50R				SE02		...
SLD_MAT	29/07/2022 09:29:29	FTP_DAU50R				SE02		...
CAcheck	29/07/2022 07:21:00	FTP_DAU50R				SE02		...
CA_SpreadRC_Name_ID_NUMBER_TC01	29/07/2022 06:28:43	FTP_DAU50R				SE02		...
SPRNetRateAuto01	29/07/2022 05:12:01	FTP_DAU50R				SE02		...
Auditcheck01	29/07/2022 03:59:25	FTP_DAU50R				SE02		...
Test_Invg_Type	29/07/2022 13:05:56	FTP_DAU50R				SE02		...
ReformCurve_TC2_TC1_EC	28/07/2022 10:50:45	FTP_DAU50R				SE02		...
HR_CA2	26/07/2022 09:45:17	FTP_DAU50R				SE02		...
HR_CA1	26/07/2022 09:39:17	FTP_DAU50R				SE02		...
SpreadFromRateRate_TC1_EC	26/07/2022 06:48:58	FTP_DAU50R				SE02		...
TRRateComplex	26/07/2022 13:24:58	FTP_DAU50R				SE02		...
mpRateRate1	26/07/2022 13:22:40	FTP_DAU50R				SE02		...
PS - Consolidated TP Rule	25/07/2022 11:56:07	FTP_DAU50R				SE02		...

31.2 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. The Term Point Selection section is displayed.
3. Update the Percentage Value for each Term Point.

Note:

The sum of all the percentages for all Term Points must add up to 100.

4. To remove a Yield Curve Point from the Percentages/Term Points table, select the term point(s) and click the **Delete** icon.

31.2.1 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. For example, 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.

31.2.1.1 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 31-2 Transfer Pricing Rule Definition (Edit Mode)

The screenshot shows the 'Transfer Pricing Rule Definition (Edit Mode)' interface. It is a web-based form with several sections:

- Transfer Pricing Rule:** Includes fields for Name (FP2018-0001), Description, and Access Type (Read/Write).
- Selected Values:** Includes Selected Product (Loan/MSA) and Selected Currency (USD).
- Transfer Pricing Method Selector:** Includes Data Source (Account Table) and Transfer Pricing Method (Moving Averages).
- Transfer Pricing Method Mapping:** Includes Transfer Pricing Method (Moving Averages), Interest Rate Code (Please Select IRC), and various mapping options like Accruals/Amort and Historical Range.
- Assumptions:** Includes Model With Green Rate, Multiplier Calendar, and other configuration options.

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.

For defining assumptions with Default Currency, you must perform the basic steps for creating or updating Transfer Pricing Rules.

Procedure:

The following table describes the key terms used for this procedure.

Table 31-1 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.

Table 31-1 (Cont.) Fields in the Transfer Pricing Rule Definition Screen

Term	Description
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.
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 with Currency module 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 Transfer Pricing 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 are 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:
 - a. Select Run using Monte Carlo Option Cost Method. The Target Balance drop-down list is displayed.
 - b. 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).
 11. Select the Holiday Calendar. The screen displays the Holiday Calendar inputs only for Cash Flow TP Methods – Duration, Average Life, Weighted Term, and Zero Discount Factors. The default assumption is None, meaning the 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 31-3 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.

 **Note:**

Economic Value Calculations are now supported for account rate tiers as well.

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 Cloud Service 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.

31.2.1.1.1 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.

Table 31-2 Transfer Pricing Combinations

Transfer Pricing Methodology	Data Source: Account Table	Interest Rate Code	Behavior Pattern	Holiday Calendar
Do Not Calculate	Yes			
Cash Flow: Average Life	Yes	Yes		Yes

Table 31-2 (Cont.) Transfer Pricing Combinations

Transfer Pricing Methodology	Data Source: Account Table	Interest Rate Code	Behavior Pattern	Holiday Calendar
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		
Straight Term	Yes	Yes		
Spread from Interest Rate Code	Yes	Yes		
Spread from Note Rate	Yes			
Redemption Curve	Yes	Yes		
Tractor Method	Yes	Yes	Yes	Yes
Caterpillar	Yes	Yes	Yes	
Weighted Average Perpetual	Yes	Yes	Yes	
Unpriced Account				

 **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.

31.2.1.1.2 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 Methodologies, such as the Redemption Curve or the Unpriced Account Methods.

Table 31-3 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								
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								

31.3 Associating Conditional Assumptions with Assumption Rules

Oracle Funds Transfer Pricing Cloud Service extends the setup and maintenance of assumptions by allowing users to integrate conditional logic (optional) into the setup of Transfer Pricing, Prepayment, and Transfer Pricing Adjustment methods. The Caterpillar Method under Transfer Pricing Rules will not be available for selection under Conditional Assumptions.

The Conditional Assumption UI is accessed from the Assumption Browser by selecting the Conditional Assumption icon.

Figure 31-4 Assumption Browser

The screenshot shows the 'Assumption Browser' interface. It features a table with the following columns: Product, Method, Conditional Assumption, Status, and Action. The table is filtered to show assumptions for the 'Asset' product. The assumptions listed are Loan A, Loan B, Loan C, and Loan D. Loan D is selected with a checked checkbox. Each row has a three-dot menu icon in the Action column.

Product	Method	Conditional Assumption	Status	Action
▼ <input type="checkbox"/> Asset				...
<input type="checkbox"/> Loan A	Moving Averages	No	Defined	...
<input type="checkbox"/> Loan B	Straight Term	No	Defined	...
<input type="checkbox"/> Loan C	Spread from Interest Rate Code	No	Defined	...
<input checked="" type="checkbox"/> Loan D				...

The conditional logic is defined using Data Filters and/or Maps. These existing objects provide the building blocks for defining Conditional logic. For example, each Data Filter can provide the logic for a specific condition. In the following example, the Where clause is “Adjustable Type Code = ‘Adjustable Rate’”. This type of Data Filter can be selected within the Conditional Assumption UI.

For more information on working with Filter, see the Filters document.

For example, you can use the Org Unit column to drive the assignment of Transfer Pricing Methods for all members of a particular Organization. You can create one Conditional Assumption to convey the entire Transfer Pricing Methodology logic and attach it to the top-level node of the Org Unit hierarchy. All nodes below the top-level node inherits the same Transfer Pricing assumption.

The logic included in a Conditional Assumption determines the specific Transfer Pricing method, Prepayment assumption, or Adjustment Rule that the system assigns to each instrument record at Run time.

The Conditional Assumption screen allows users to select explicit conditions (from Data Filters and/or Hierarchy Filters), apply methods, and rule selections to each condition directly. The Filter Conditions are processed by the engine in the order that they appear on the screen. After a condition is satisfied, the related assumption is applied. The following figure displays a representative Conditional Assumption using a Data Filter:

Figure 31-5 Conditional Assumptions

The screenshot shows a configuration interface for Conditional Assumptions. On the left, under the heading 'Conditional Assumptions', there are fields for 'Selected Product' (containing 'Loan/2024'), 'Data/Group Filter' (with a plus icon), 'Folder' (a dropdown menu showing 'SEG2'), and 'Condition Groups' (with a radio button). On the right, there are fields for 'Selected Currency' (containing 'USD'), 'Hierarchy Filter' (with a radio button), 'Filters' (a dropdown menu), and 'Condition Group List' (a dropdown menu). There are also three small square icons to the right of the 'Condition Group List' field and an 'Add' button at the bottom center.

 **Note:**

If an instrument record does not meet any of the conditions, then the rule logic reverts to the standard assumption that is directly assigned to the Product / Currency combination.

Conditional Assumptions can be applied only to detailed account records (data stored in the Instrument Tables).

31.4 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 Transfer Pricing Rate is equivalent to the rate on the associated Interest Rate Curve corresponding to the calculated term.

Figure 31-6 Cash Flow: Average Life

The screenshot shows a configuration interface for Transfer Pricing Method Mapping. Under the heading 'Transfer Pricing Method Mapping', there is a 'Transfer Pricing Method' dropdown menu containing 'Cash Flow: Average Life'. Below this, there is an 'Output Average Life To Instrument' checkbox which is currently unchecked. To the right of this checkbox is an 'Interest Rate Code' dropdown menu, which is currently empty and has a 'Required' label below it. At the bottom, there is a 'Cash Flow Type' section with two radio buttons: 'Principal' (which is selected) and 'Principal and Interest'.

Figure 31-7 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 Funds Transfer Pricing Cloud Service 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 the price of the instrument being analyzed. The Average Life Calculation does not differentiate between fixed-rate and adjustable-rate instruments. It applies the same calculation logic to both. It computes the Average Life of the Loan (to maturity).

 **Note:**

The Average Life Transfer Pricing 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 refer to the Average Life as a reference term within an Adjustment Rule.

Users also have the choice to populate the TP_AVERAGE_LIFE column directly with a value computed outside of Oracle Funds Transfer Pricing Cloud Service. If this value is populated, the Funds Transfer Pricing Cloud Service Engine reads the TP_AVERAGE_LIFE and will look up the Funds Transfer Pricing Rate for the given term. In this case, the Transfer Pricing Engine does not generate Cash Flows and will not re-compute the Average Life. It simply uses the value that is provided and lookup the appropriate Funds Transfer Pricing Rate from the specified TP Interest Rate Curve.

31.5 Cash Flow: Duration

The Duration Method uses the Macaulay Duration Formula:

Figure 31-8 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
- CF_n: 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
- t_n: Remaining term to Cash Flow n, expressed in years

Oracle Funds Transfer Pricing Cloud Service 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.

 **Note:**

NOTE: The Duration Transfer Pricing 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 refer to the duration as a reference term within an Adjustment Rule.

Figure 31-9 Cash Flow: Duration

Users also have the choice to populate the TP_DURATION column directly with a value computed outside of Oracle Funds Transfer Pricing Cloud Service. If this value is populated, the FTP engine reads the TP_DURATION and will look up the FTP Rate for the given term. In this case, the TP Engine does not generate Cash Flows and will not re-compute the DURATION. It simply uses the value that has been provided and look up the appropriate FTP Rate from the specified TP Interest Rate Curve.

31.6 Cash Flow: Weighted Term

The Weighted Term method builds on the theoretical concepts of duration. You can use the Cash flow Duration TP Method approach to the Cash Flow Weighted Term Method. Based on that, the following Cash Flow Discounting Methods are used:

- Multiple Rate
- Single Rate

For more information, see the [Working with Transfer Pricing Rules](#) Section.

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.

Since the goal of the Weighted Term Method is to calculate a Weighted Average Transfer Rate, it weights the transfer rate in each period, y_n , 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. Long-term Cash Flows have a relatively larger impact on the average transfer rate. The Weighted Term method, with Discounted Cash Flow option selected, can be summarized by the following formula:

Figure 31-10 Cash Flow: Weighted Term Formula

$$\text{Weighted-Average} = \bar{y} = \frac{\sum_{n=1}^N \left[y_n \times \frac{CF_n}{(1+r)^m} \times t_n \right]}{\sum_{n=1}^N \left[\frac{CF_n}{(1+r)^m} \times t_n \right]}$$

In this formula:

- N: Total number of payments from Start Date until the earlier of repricing or maturity
- CF_n: 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 n/active payment frequency
- t_n: Remaining term to Cash Flow n, expressed in years
- y_n: Transfer Rate in period n

Within the Cash Flow Weighted Term method definition screen, users can select the Cash Flow type as either Principal + Interest (the default selection) or Principal Only. This selection impacts the CF_n in the above formula.

Additionally, users can choose whether or not to discount the cash flows as described above. If the "Cash Flow" option is selected rather than "Discounted Cash Flow", the following simplified formula is applied:

Figure 31-11 Cash Flow: Weighted Term Formula without Discounted Cash Flow

$$\text{Weighted Average } - y = \left(\frac{\sum_{n=1}^N [y_n \times CF \times t_n]}{\sum_{n=1}^N [CF \times t_n]} \right)$$

For this method, the following options are also provided:

- Cash Flow Weighted Rate
- Cash Flow and Terms Weighted Rate (by default, this will remain selected for all existing definitions)

If Transfer Rate needs to be weighed only by Cash Flow rather than both Cash Flow and the Cash Flow Weighted Rate can be selected, and the system will not consider terms (t_n) for calculations.

If Cash Flow and Terms Weighted Rate is selected, then both terms, as well as Cash Flow, will be used for Weighing Transfer Rate as per calculations shown above.

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 from the instrument record unless the processing option, "Model with Gross Rates" is selected, in which case, the current gross rate is used. The current rate is used as a constant discount rate for each cash flow.
- The user may directly input while defining the Transfer Pricing Rule, a single constant rate to use for discounts. If specified, this rate is used as a constant discount rate for each cash 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.

 **Note:**

When validating the Cash Flow Weighted Term Transfer Rate, FE 492 (Discount Factor) from detail Cash Flow output is useful. FE 490 (Discount Rate) however, may be incorrect in the detailed Cash Flow output if the Current Net Rate is specified as the discount rate. This condition does not affect the accuracy of the calculated discount factor, only the Audit Table Rate Output for FE 490. If multiple rate discounting (based on IRC) or a single custom rate is specified, then FE 490 will be correct.

Figure 31-12 Cash Flow: Weighted Term

The screenshot shows the 'Transfer Pricing Method Mapping' configuration interface. The 'Transfer Pricing Method' is set to 'Cash Flow: Weighted Term'. The 'Cash Flow Type' is set to 'Principal' (selected with a radio button). The 'Cash Flow Discounting Methods' are set to 'Multiple Rate' (selected with a radio button). The 'Interest Rate Code' field is empty and marked as 'Required'.

31.7 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-coupons).

Figure 31-13 Cash Flow: Zero Discount Factors

The screenshot shows the 'Transfer Pricing Method Mapping' configuration interface. The 'Transfer Pricing Method' is set to 'Cash Flow: Zero Discount Factors'. The 'Interest Rate Code' field is empty and marked as 'Required'.

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 example below) because they are the appropriate vehicles in strip funding (that is, there are no intermediate Cash Flows between the 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 31-14 Zero Discount Factors = y =

$$100 \times \left[\frac{B_0 - \sum_{n=1}^N (B_{n-1} \times DTP_n) + \sum_{n=1}^N (B_n \times DTP_n)}{\sum_{n=1}^N (B_{n-1} \times DTP_n)} \right] \times p$$

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)

This table illustrates how to derive Zero Coupon Discount factors from monthly pay Transfer Pricing Rates.

Table 31-4 Deriving Zero-Coupon Discount Factors: An Example

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

 **Note:**

For the ZDF method, the discount factor used for discounting cash flows is output as FE 490, after multiplied by 100.

31.8 Caterpillar

The Caterpillar Method extends the concept of Strip Funding to instruments that do not have contractual Cash Flows. These products are known as Perpetual or Non-Maturity Products and therefore do not generate contractual Cash Flows. The process of determining Transfer Rates requires adopting the 'Strip Funding Approach' by splitting these products into 'Core' and 'Volatile' portions based on statistically established Behavioral Profiles. With this approach, the volatile portion may be considered as an overnight funding strip and the core portion can be dealt with by an assumed maturity structure defined through a Behavior Pattern. For example, statistical analysis may imply that the Savings Account portfolio behaves 20% as volatile and 80% as the core of which the maturity is likely to be 3 months. Therefore, the Funding Strips that would get created are 20% 1 month, and 80% 3 months.

Figure 31-15 Caterpillar

▼ Transfer Pricing Method Mapping

Transfer Pricing Method

Behavior Pattern

Interest Rate Code

Required

Table 31-5 BEHAVIORAL PATTERN: 20% 1 Month; 80% 3 Months

Period	EOP Balance	Production			IRC			TP Rate
		1M	2M	3M	1M	2M	3M	
Month 1	4000	800		3200	4.00%	4.25%	4.50%	4.40%
Month 2	7000	760	3200	3040	4.50%	4.75%	5.00%	4.72%
Month 3	8500	3652	3040	1808	5.00%	5.25%	5.50%	4.92%
Month 4	9000	3870	1808	3322	5.50%	5.75%	6.00%	5.52%
Month 5	8000	2382	3322	2296	6.00%	6.25%	6.50%	6.03%

In the example, we assume that once a funding strip is assigned a certain Transfer Rate based on its original term, the rate remains constant until the strip matures. Each strip is funded for the original term based on the yield curve in effect at the start of the strip. In month 4, when the balance is 9000, the strips still outstanding from earlier months are 3040 as a 3-month term strip, created in month 2 at 5% having a remaining term 1-month; (3870-3040) 1-month term strip created in month 4, 1808 3-month term strip created in month 3 with the 2-month remaining term, and 3322 3-month term strip created in month 4. The weighted average rate of these strips comes to 5.52% as the example shows.

In summary:

$$\text{Month 4 Transfer Rate} = (3040 \times 5\% + (3870 - 3040) \times 5.5\% + 1808 \times 5.5\% + 3322 \times 6\%) / 9000 = 5.52\%$$



Note:

The Caterpillar Method must not be run more than once for a given date as this may corrupt the historical data. The strip data for this method is stored in the database in the CATERPILLAR_INTER_NEXTGEN table.

31.9 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 Cloud Service 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.

31.10 Defining 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.

31.11 Defining Tractor Methodology

The prerequisites for defining a Tractor Methodology are:

- Creating a Replicating Portfolio.
- 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 Replicating Portfolio.
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.

31.12 Defining Transfer Pricing Methodologies Using Node Level Assumptions

In Oracle Funds Transfer Pricing Cloud Service, your product portfolio is represented using the Product Dimension specified in your FTP Application Preferences. Node Level Assumptions allow you to define Transfer Pricing, Prepayment, and Adjustment Assumptions at any level of the Product Dimension Hierarchy. The Product Dimension supports a Hierarchical Representation of your Chart Of Accounts, therefore, you can take advantage of the Parent-Child relationships defined for the various nodes of your Product Hierarchies while defining Transfer Pricing, Prepayment, and Adjustment Assumptions. Child nodes for which no assumptions are 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.

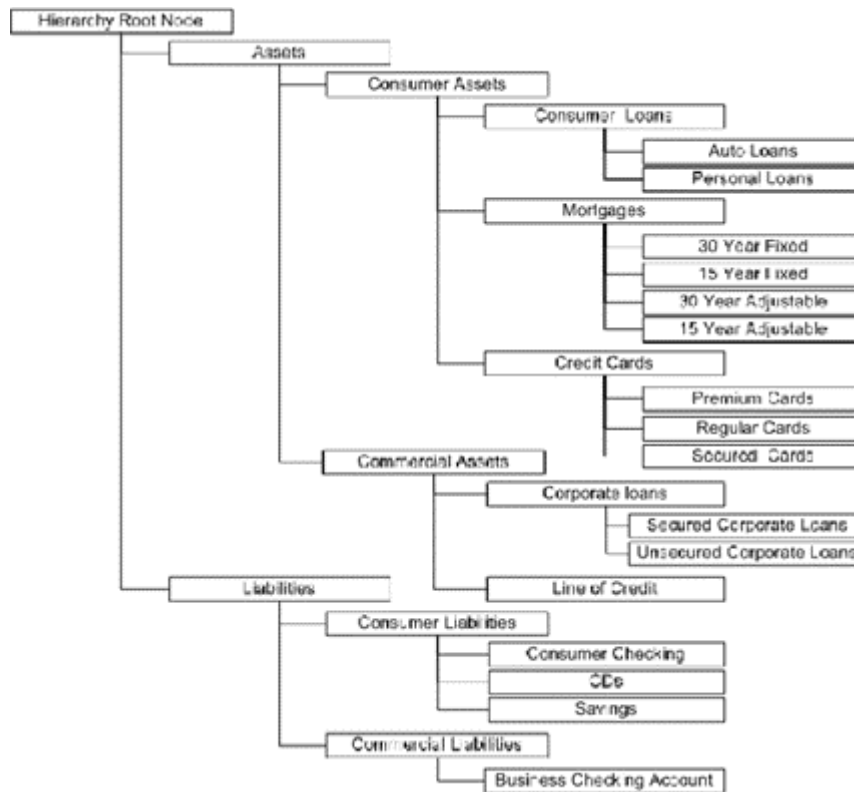
Node level Assumptions simplify the process of applying rules in the user interface and significantly reduce the effort required to maintain Business Rules over time as new products are added to the product mix. It is also not required for all rules to assign assumptions to the same nodes. Users may assign assumptions at different levels throughout the Hierarchy.

Note:

While creating a new rule, if you perform any activities (such as Conditional Assumption Creation, Defining Products, Search, Copy Across, and so on) in the Assumption window and click the Cancel button, the Rule will be saved with basic Rule definition and displayed in Rule Summary Page.

The Behavior of Node Level Assumptions: The following graphic displays a Sample Product Hierarchy:

Figure 31-16 Sample Product Hierarchy



For example, 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

Figure 31-17 Assumption Browser

Assumption Browser		Assumption List		
Product	Method	Conditional Assumption	Status	Action
▼ <input type="checkbox"/> Asset				...
<input type="checkbox"/> Loan A	Moving Averages	No	Defined	...
<input type="checkbox"/> Loan B	Straight Term	No	Defined	...
<input type="checkbox"/> Loan C	Spread from Interest Rate Code	No	Defined	...
<input checked="" type="checkbox"/> Loan D				...

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 previous example. Since the 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:

Not specifying assumptions for a node is not the same as selecting the "Do Not Calculate" method. 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, then the Oracle Funds Transfer Pricing Cloud Service 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. However, if the parent node has the "Do Not Calculate" method assigned to it then the child node inherits "Do Not Calculate", preventing the need for calculation and a processing error.

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.

31.13 Exceptions to Typical Calculations

There are two exceptions to Mid-Period Repricing Computations:

- **Teased Loan Exception:** When the TEASER_END_DATE is the first Repricing Date, it overrides all other values for LAST_REPRICE_DATE and NEXT_REPRICE_DATE. During the Teased Period, then, the Computed Last Repricing Date equals the Origination Date and the Computed Next Reprice Date equals the TEASER_END_DATE. Consequently:
 - If the TEASER_END_DATE is greater than the AS_OF_DATE, the Mid-Period Repricing does not apply. The logic to compute the Transfer rate is based upon the term equal to the TEASER_END_DATE - ORIGINATION_DATE, date equals the ORIGINATION_DATE.
 - When rolling backward by Repricing Frequency, if the TEASER_END_DATE is greater than the Computed Last Repricing Date, Transfer Pricing computes the transfer rates for that period based on the teased loan exception.
- **Origination Date Exception:** While performing Mid-Period Repricing Computations, Oracle Funds Transfer Pricing Cloud Service assumes that if the origination date occurs during the processing month, the calculation of the number of days (used for weighting) originates on the first day of the month. This is a safe assumption because the PRIOR_TP_PER_ADB value shows this instrument was not on the books for the entire month. This impact is measured because the PRIOR_TP_PER_ADB value is used in computing the weighted average transfer rate. If Oracle Funds Transfer Pricing Cloud Service were to shorten the number of days (as in the weighted average calculation), it would double-count the impact.

The following table displays a situation where the Origination Date occurs during the processing month:

Table 31-6 Origination Date Exception: An Example

Period 1	Period 2	Period 3
Nov 1 - Nov 10	Nov 11 - Nov 20	Nov 21 - Nov 30
	Loan is originated	Loan reprices
Loan Balance = 0	Loan Balance = 100	Loan Balance = 100
Transfer Rate = 0	Transfer Rate = 6%	Transfer Rate = 8%
Days = 10	Days = 10	Days = 10
Weighting Balance = 50 = PRIOR_TP_PER_ADB	Weighting Balance = 50 = PRIOR_TP_PER_ADB	Weighting Balance = 100 = CUR_TP_PER_ADB

 **Note:**

The cumulative average daily balance for period 1 plus period 2 is 50.

Considering the origination date exception, the Mid-Period Repricing calculation is done as follows:

$$(6\% * \$50 * 20 \text{ days}) + (8\% * \$100 * 10 \text{ days}) / (\$50 * 20 \text{ days} + \$100 * 10 \text{ days}) = 7\%$$

If period 1 was not taken into account, the result will be, $(6\% * \$50 * 10 \text{ days}) + (8\% * \$100 * 10 \text{ days}) / (\$50 * 10 \text{ days} + \$100 * 10 \text{ days}) = 7.33\%$, which is incorrect.

31.14 Mid-Period Repricing Computations

The Mid-Period Repricing option uses two columns in the Instrument Tables (Current- and Prior- Repricing Period Average Daily Balance: CUR_TP_PER_ADB, PRIOR_TP_PER_ADB) that are exclusively devoted to this option. These columns must be accurately populated for the Mid-Period Repricing results to be accurate.

The Mid-Period Repricing Computation process comprises the following steps:

1. Computation of transfer rate for the Current Repricing Period.
2. If the computed Last Repricing Date is less than (>) the beginning of the processing month, then roll back to the Prior Repricing Date.
3. Computation of Prior Period Transfer Rate.
4. Repetition of steps 2 and 3 as necessary.
5. Computation of the final transfer rate by weighting the results (from Current and previous Repricing Periods) by average balances and days.
6. Application of the final transfer rate to the instrument record.

31.15 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 the transfer prices. For example, you can use a 12-month moving average of the 12-month rate to transfer price of a particular product.

Figure 31-18 Moving Averages

Transfer Pricing Method Mapping

Transfer Pricing Method: Moving Averages

Interest Rate Code: Required

Arithmetic Mean Geometric Mean

Term Points:

Yield Curve Term: Required

Historical Range: Required

The following options become available on the UI along with Arithmetic and Geometric mean, with this method:

- Interest Rate Code: Select the Interest Rate Code to be used as the Yield Curve to generate transfer rates.
- Assignment Date: The Assignment Date allows you to choose the date from which the Moving Average will be calculated. Choices available are the As of Date, Last

Repricing Date, Origination Date, Commitment Start Date, TP Effective Date, or Adj Effective Date. If the selected date is null or 01-Jan-1900, then As of Date will be used as fallback logic.

- Yield Curve Term: The Yield Curve Term defines the point on the Interest Rate Code that is used.
- Historical Range: The Historical Term defines the period over which the average is calculated.

The following table illustrates the difference between the Yield Curve and Historical Terms.

Table 31-7 Yield and Historical Terms: An Example

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 Term plus one, because the Historical Term includes the As-of-Date.

Table 31-8 Assignment Date and Transfer Rate Calculation

Icons	Description
As Of Date	If the As-of-Date is Nov 21, the Yield Curve Term selected is Daily, and the Historical Term selected is 3 Days, then, the system calculates 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. As-of-Date is available only if the selected source is Ledger Table.
Last Repricing Date	If the Last Repricing Date is Nov 21, the Yield Curve Term selected is Daily, and the Historical Term selected is 3 Days, then, the system calculates 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.
Origination Date	If the Origination Date is Nov 21, the Yield Curve Term selected is Daily, and the Historical Term selected is 3 Days, then, the system calculates 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.
Commitment Start Date	If the Commitment Start Date is Nov 21, the Yield Curve Term selected is Daily, and the Historical Term selected is 3 Days, then, the system calculates 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.

Table 31-8 (Cont.) Assignment Date and Transfer Rate Calculation

Icons	Description
TP Effective Date	If the TP Effective Date is Nov 21, the Yield Curve Term selected is Daily, and the Historical Term selected is 3 Days, then, the system calculates 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.
Adjustment Effective Date	If the Adjustment Effective Date is Nov 21, the Yield Curve Term selected is Daily, and the Historical Term selected is 3 Days, then, the system calculates 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.

 **Note:**

If any of the above date values are 01-Jan-1900 or blank or null, then the Oracle Funds Transfer Pricing Cloud Service engine considers the As-of-Date for Transfer Rate calculation.

After you select the date, Oracle Funds Transfer Pricing Cloud Service computes the Historical Rate using the selected date. Oracle Funds Transfer Pricing Cloud Service takes the values of the yield curve points that fall within that range and does a straight average.

 **Note:**

The Moving Averages method applies to either data source: Management Ledger Table or Account Tables.

31.16 Overview of Transfer Pricing Methodologies and Rules

The Transfer Pricing Methodologies supported by Oracle Funds Transfer Pricing Cloud Service can be grouped into the following 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, therefore, preventing you from applying Cash Flow 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 Transfer Pricing Process.

Oracle Funds Transfer Pricing Cloud Service 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. While some of the non-Cash Flow Methods are available only with the Account Tables Data Source, some are available with both the Account and Ledger Table Data Sources.

Oracle Funds Transfer Pricing Cloud Service supports the following Non-Cash Flow Transfer Pricing Methods:

- Moving Averages
- Straight Term
- Spread from Interest Rate Code
- Spread from Note Rate
- Redemption Curve
- Tractor Method
- Caterpillar
- Weighted Average Perpetual
- Unpriced Account

Oracle Funds Transfer Pricing Cloud Service also allows Mid-period Repricing. This option allows you to take into account the impact of high market rate volatility while generating transfer prices for your products. However, the mid-period Repricing option applies only to Adjustable-Rate Instruments and is available only for certain Non-Cash Flow Transfer Pricing Methods.

Note on Bulk Updates versus Row by Row Processing: Any Transfer Pricing Method that does not refer to individual account characteristics utilizes a bulk update to assign a single transfer rate to a group of instrument records. Any TP Method that needs to refer to individual account characteristics to process will execute on a row-by-row basis. In general, Bulk updates are faster than row-by-row processing.

The following Transfer Pricing Methods, when not defined through a conditional assumption and not utilizing Mid-Period Repricing, use Bulk Updates:

- Redemption Curve (Assignment Date = As-of-Date only)
- Moving Average
- Spread from Note Rate
- Spread from IRC (Assignment Date = As-of-Date only)

All other Transfer Pricing Methods like Tractor, Caterpillar, and Weighted Average Perpetual are processed row-by-row. When Conditional Assumptions or Mid Period Repricing are used, processing will always be row-by-row, regardless of the Transfer Pricing Method Selection.

31.17 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.

Figure 31-19 Redemption Curve

Transfer Pricing Method Selector

Data Source: Account Tables Output Audit Detail

Transfer Pricing Method: Redemption Curve

Transfer Pricing Method Mapping

Transfer Pricing Method: Redemption Curve

Interest Rate Code: PS - ZCB Curve Assignment Date: As Of Date

Assumptions

Model With Gross Rate Run Using Monte Carlo Option Cost Method

Mid-Period Holiday Calendar:

Rolling Convention: Unadjusted Interest Calculation Logic: Shift Dates Only Recalculate Payment

Term Point Selection

Add Term Points: 1 Months X 30 Years X

Term Points %	Percentage %
1 Months	0.7000
30 Years	0.3000
Total Percentage :	1

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, Adjustment Effective Date, or TP Effective Date.
- **Percentages or Term Points:** See [Redemption Curve](#).
- **Mid-Period Repricing Option:** Select the check-box beside this option to invoke the Mid-Period Repricing option.

**Note:**

The Redemption Curve method applies to either data source: Ledger Table or Account Tables.

31.18 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.

Figure 31-20 Spread from Interest Rate Code

Transfer Pricing Method Mapping

Transfer Pricing Method: Spread from Interest Rate Code

Interest Rate Code: Required

Rate Spread:

Assignment Date: As Of Date

Term Points: No Term Point Defined

Yield Curve Term: Months Required

Lag Term: Months Required

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, Adjustment Effective Date, or TP Effective Date.
- **Mid-Period Repricing Option:** Select the check box beside this option to invoke the Mid-Period Repricing option.

**Note:**

The Spread From Interest Rate Code Method applies to either data source: Ledger Table or Account Tables.

31.19 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.

Figure 31-21 Spread from Note Rate

▼ Transfer Pricing Method Mapping

Transfer Pricing Method

Rate Spread

Required

While entering the Rate Spread, ensure to input it with the appropriately 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 should enter a negative rate spread.

Table 31-9 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)

The following option becomes available in the application when you select this method:

- **Mid-Period Repricing Option:** Select the check-box beside this option to invoke the Mid-Period Repricing option.



Note:

The Spread From Note Rate Method applies only to accounts that use Account Tables as their data source.

31.20 Straight Term

When you select the Straight Term method and Standard Term Approach, the Oracle Funds Transfer Pricing Cloud Service 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.

- 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 the 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 the tease period, use the Last Repricing Date and Repricing Frequency.

**Note:**

For loans in the Tease period, the Next Reprice Date should reflect the end of the Tease Period and the Reprice Frequency should reflect the expected Reprice Frequency after the tease period ends.

- 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.

Figure 31-22 Straight Term

▼ Transfer Pricing Method Selector

Data Source Output Audit Detail

Transfer Pricing Method

▼ Transfer Pricing Method Mapping

Transfer Pricing Method

Interest Rate Code Required

▼ Assumptions

Term Adjustment Operator

Adjustment Amount Model With Gross Rate

Run Using Monte Carlo Option Cost Method Mid-Period

Holiday Calendar Rolling Convention

Interest Calculation Logic Shift Dates Only Recalculate Payment

In addition to the standard logic used for determining the appropriate “Term”, users also have the option to select either Original Term or Repricing Frequency and also have the option to modify these terms using simple mathematical operators. These options can be useful in

cases where the straight term method should be applied to the same record under different circumstances. For example, for calculating the base rate on an adjustable-rate instrument, the standard approach should be used. For the same instrument, users may further want to use the entire Original Term for applying a liquidity premium or other add-on rate. To support the second case, we give the option to directly specify the term to be used, and we further provide the option to modify the term using simple operators, such as +, -, *, /.

The following options become available in the application with this method:

- **Term:** Select from Standard, Original Term, or Reprice Frequency. Standard is the default selection and the resulting Term will follow the above logic. The Original Term and Reprice Frequency options allow users to override the standard logic and specify which term to use.
- **Adjustment Operator:** When either Original Term or Reprice Frequency is selected as the Term, the Adjustment Operator becomes active. The term Adjustment is optional and gives users the ability to modify the term
- **Adjustment Amount:** This input works together with the Adjustment Operator to indicate how the term should be modified.
- **Interest Rate Code:** Select the Interest Rate Code to be used for Transfer Pricing the account.
- **Mid-Period Repricing Option:** Select the check box beside this option to invoke the Mid-Period Repricing option.
- **Holiday Calendar:** Select whether a Holiday Calendar is applicable for calculating the charges/credits or for calculating Economic Value.
- **Rolling Convention:** Select the appropriate Business Day Rolling Convention if a Holiday Calendar is selected.
- **Interest Calculation Logic:** Select the appropriate option to indicate how the interest payment should be adjusted when a Holiday Date is encountered.

 **Note:**

The Straight Term method applies only to accounts that use Account Tables as the Data Source.

For more information, see the [Working with Transfer Pricing Rules](#) section.

31.21 Tractor Method

The Tractor Method extends the concept of Strip Funding to instruments that do not have contractual Cash Flows. These products are known as perpetual or non-maturity products and hence do not generate contractual Cash Flows. The process of determining transfer rates requires adopting the strip funding approach by splitting these products into Core and Volatile portions based on statistically established Behavioral Profiles. With this method, the volatile portion is considered to have an overnight maturity and the core portion is assigned a longer maturity (through Replicating Portfolio) which is comprised of a series of balance strips corresponding to the maximum tenor of the portfolio (on the origination of the portfolio, original strips will have shorter maturities). Each strip is assigned a transfer rate corresponding to its

Origination Date and corresponding Term. The historical, active strips are retained for the portfolio and the Portfolio Transfer Rate is determined based on the Weighted Average Transfer Rate of the strips comprising the portfolio. The Weighted Average Rate from the strip portfolio is written back to all instrument records that are mapped to this portfolio through the Transfer Pricing Rule.

Figure 31-23 Tractor Method

▼ Transfer Pricing Method Mapping

Transfer Pricing Method:

Replicating Portfolio:

Interest Rate Code:

Required

The characteristics of the replicating portfolio used by the Tractor Method are defined through Replicating Portfolio Module. The following example illustrates the behavior of a small 3-day portfolio rolling across 4 days.

Table 5:

Table 31-10 Replicating Portfolio

31-Jan-11						
Strip	Start	Maturity	Balance	TP Rate	Date Rolled	Comment
0A	31-Jan-11	1-Feb-11	100	5.00%	1-Feb-11	
0B	31-Jan-11	2-Feb-11	100	5.10%	3-Feb-11	
0C	31-Jan-11	3-Feb-11	100	5.20%	3-Feb-11	Matures and rolls to 3A
1A	1-Feb-11	4-Feb-11	100	5.30%		
2A	2-Feb-11	7-Feb-11	100	5.40%		
3A	3-Feb-11	8-Feb-11	100	5.50%		Rollover strip, TP's by the engine
Day 1						
1-Feb-11	Daily Rollover					
Strip	Start	Maturity	Balance	Rate	Date Rolled	Comment
0A	31-Jan-11	1-Feb-11	100	5.00%	1-Feb-11	Matures and rolls to 1A
0B	31-Jan-11	2-Feb-11	100	5.10%		
0C	31-Jan-11	3-Feb-11	100	5.20%		
1A	1-Feb-11	4-Feb-11	100	5.30%		Rollover strip, TP's by the engine

Table 31-10 (Cont.) Replicating Portfolio

31-Jan-11						
Strip	Start	Maturity	Balance	TP Rate	Date Rolled	Comment
	Day 1 Maturity Profile					
	Total	Day 1 2-Feb-11	Day 2 3-Feb-11	Day 3 4-Feb-11		Tractor TP Rate 5.20%
	300	100	100	100		
Day 2 2-Feb-11	Daily Rollover					
0A	31-Jan-11	1-Feb-11	100	5.00%	1-Feb-11	
0B	31-Jan-11	2-Feb-11	100	5.10%	2-Feb-11	Matures and rolls to 2A
0C	31-Jan-11	3-Feb-11	100	5.20%		
1A	1-Feb-11	4-Feb-11	100	5.30%		
2A	2-Feb-11	7-Feb-11	100	5.40%		Rollover strip, Transfer Priced by the engine
	Day 2 Maturity Profile					
	Total	Day 1 3-Feb-11	Day 2 4-Feb-11	Day 3 7-Feb-11		Tractor TP Rate 5.30%
	300	100	100	100		
Day 3 3-Feb-11	Daily rollover, and new business (reduction of 530)					
0A	31-Jan-11	1-Feb-11	100	5.00%	1-Feb-11	
0B	31-Jan-11	2-Feb-11	100	5.10%	3-Feb-11	
0C	31-Jan-11	3-Feb-11	100	5.20%	3-Feb-11	Matures and rolls to 3A
1A	1-Feb-11	4-Feb-11	100	5.30%		
2A	2-Feb-11	7-Feb-11	100	5.40%		
3A	3-Feb-11	8-Feb-11	100	5.50%		Rollover strip, Transfer Priced by the engine
3B	3-Feb-11	4-Feb-11	10	5.50%		New Business strip, Transfer Priced by the engine

Table 31-10 (Cont.) Replicating Portfolio

31-Jan-11						
Strip	Start	Maturity	Balance	TP Rate	Date Rolled	Comment
3C	3-Feb-11	7-Feb-11	10	5.50%		New Business strip, Transfer Priced by the engine
3D	3-Feb-11	8-Feb-11	10	5.50%		New Business strip, Transfer Priced by the engine
	Day 3 Maturity Profile					
	Total	Day 1 4-Feb-11	Day 2 7-Feb-11	Day 3 8-Feb-11		Tractor TP Rate 5.39%
	270	90	90	90		
Day 4 4-Feb-11	Daily rollover					
0A	31-Jan-11	1-Feb-11	100	5.00%	1-Feb-11	
0B	31-Jan-11	2-Feb-11	100	5.10%	2-Feb-11	
0C	31-Jan-11	3-Feb-11	100	5.20%	3-Feb-11	
1A	1-Feb-11	4-Feb-11	100	5.30%	4-Feb-11	Matures and rolls to 4A
2A	2-Feb-11	7-Feb-11	100	5.40%		
3A	3-Feb-11	8-Feb-11	100	5.50%		
3B	3-Feb-11	4-Feb-11	-10	5.50%	4-Feb-11	Matures and rolls to 4A
3C	3-Feb-11	7-Feb-11	-10	5.50%		
3D	3-Feb-11	8-Feb-11	-10	5.50%		
4A	4-Feb-11	9-Feb-11	90	5.60%		Rollover strip, Transfer Priced by the engine
	Day 4 Maturity Profile					
	Total	Day 1 7-Feb-11	Day 2 8-Feb-11	Day 3 9-Feb-11		Tractor TP Rate 5.50%
	270	90	90	90		

This example assumes a business day calendar is enabled with the following business days defined:

- Business Day

- Calendar
- 31-Jan-11
- 1-Feb-11
- 2-Feb-11
- 3-Feb-11
- 4-Feb-11
- 7-Feb-11
- 8-Feb-11
- 9-Feb-11
- 10-Feb-11
- 11-Feb-11

31.22 Transfer Pricing Methods and the Mid-Period Repricing Option

The Mid-Period Repricing option allows you to take into account the impact of high market rate volatility while generating transfer rates for your products. However, the Mid-Period Repricing option applies only to adjustable-rate instruments and is available only for the following non-Cash Flow Transfer Pricing Methods:

- Straight Term
- Spread from Interest Rate Code
- Spread from Note Rate
- Redemption Curve

The rationale behind Mid-Period Repricing is as follows. If you do not select the Mid-Period Repricing option, Oracle Funds Transfer Pricing Cloud Service computes the transfer rate for an adjustable-rate instrument based upon its last Repricing Date. The assumption behind this method of calculation is that the input transfer rate for a month should be the daily average transfer rate for that entire month. Consequently, all instruments repricing in that month derive their transfer rates from the same (average) Transfer Pricing Yield Curve. However, this approach misstates the transfer rate, in periods when the interest rate level has moved substantially since the last repricing.

Take the example of a one-year adjustable-rate loan, which reprices on the 15th of the month, and that transfer rates have moved up 200 basis points since the last reprice. In this case, the theoretically pure transfer rate for the first half of the month should be 200 basis points lower than the transfer rate for the second half of the month. To apply such theoretical accuracy to your transfer pricing results, you should select the Mid-Period Repricing option.

31.23 Transfer Pricing Rule Pane

The Transfer Pricing Rule Pane presents a table containing all Transfer Pricing Rule that meet your search criteria.

The Transfer Pricing Rule Summary page displays the following columns.

- **Name:** Displays the short name of the rule.
- **Creation Date:** Displays the date and time when user created the rule.
- **Created By:** Displays the Name of the user who created the rule.
- **Access Type:** Displays the access type of the rule - Read/Write or Read Only property of a Static Table Driver rule. Only the creator of a rule may change its Access Type.
- **Folder:** Displays the folder name where the rule is stored.
- **Action:** Displays the list of actions that can be performed on the rule.

The Action column on Transfer Pricing Rule Summary page offers the following actions that allow you to perform different functions. The following actions are available for the Transfer Pricing Rule.

- **View:** Click View in the Action column and select View to view the contents of a Transfer Pricing Rule in read/write format.
- **Edit:** Click Edit in the Action column and select Edit to edit the contents of a Transfer Pricing Rule in read/write format.
- **Delete:** Click Delete in the Action column and select Delete to delete an existing Transfer Pricing Rule.

You may select or deselect all the Transfer Pricing Rule rules in the summary table by clicking the check box in the upper left-hand corner of the summary table directly to the left of the Name column header.

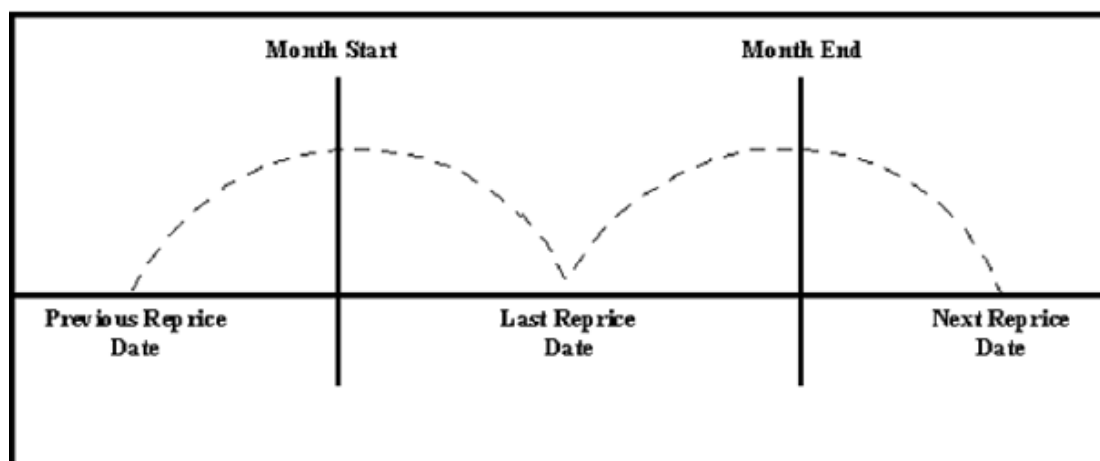
Complete standard steps for this procedure.

In addition to the standard steps for creating rules, the procedure for creating a Transfer Pricing Rule involves one extra step. 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.

31.24 Typical Calculations

The following diagram depicts a Mid-Period Repricing situation where the instrument reprices during the current processing month.

Figure 31-24 Mid-Period Repricing



If an instrument reprices during the current processing month, then there are multiple Repricing Periods spanning the current month. In this example, there are two Repricing Periods in the current processing month and the computed last Repricing Date > beginning of processing month. Consequently, the Repricing Dates need to be rolled back by the repricing frequency until the Prior Last Repricing Date (Prior LRD) <= Beginning of Month and the Mid-Period Repricing Computation process should be executed as follows:

- Computation of transfer rate for the current Repricing Period.
- Transfer Pricing Term: Next Reprice Date - Last Reprice Date
- Transfer Pricing Date: Last Reprice Date
- Number of Days at that Rate: End of Month + 1- Last Reprice Date

If the Computed Next Reprice Date (the next Repricing Date for a given Repricing Period) is less than or equal to the End of Month, then the Number of Days calculation uses the Computed Next Reprice Date in place of End of Month. In other words, the Number of Days equals the Minimum (End of Month + 1, Computed Next Reprice Date) - Maximum (Beginning of Month, Computed Last Reprice Date). This example assumes the use of the Straight Term Transfer Pricing Method. The following table describes the logic for the computation of the transfer rates for each method.

Table 31-11 Logic of Computation of the Transfer Rates for each method

Method	Date for Rate Lookup	Terms	Interest Rate Code	Spread
Straight Term	Beginning of Reprice Period	Transfer Pricing Term	Specified in Transfer Pricing rule	Not Applicable
Spread from Interest Rate Code	Beginning of Reprice Period (adjust by Lag Term in TP Rule)	Specified in Transfer Pricing rule	Specified in Transfer Pricing rule	Specified in Transfer Pricing rule
Spread from Note Rate	Beginning of Reprice Period	Transfer Pricing Term	Interest Rate Code from Record	Specified in Transfer Pricing rule
Redemption Curve	Beginning of Reprice Period	Specified in Transfer Pricing rule	Specified in Transfer Pricing rule	Not Applicable

- If the computed last Repricing Date > beginning of processing month, roll back to the Prior Repricing Date.

Since the Last Repricing Date is greater than the Beginning of the Processing month, the Roll Back is done as follows:

Computed Next Reprice Date is reset to Last Reprice Date

Computed Last Repricing Date is reset to Last Repricing Date - Reprice Frequency (Prior LRD)

- Computation of the prior period transfer rate.
- Transfer Pricing Term: Last Reprice Date - Prior LRD
- Transfer Pricing Date: Prior LRD
- Number of Days at that Rate: Last Reprice Date - Beginning of Month

If the Computed Last Reprice Date (the last Repricing Date for a given Repricing Period) is greater than the Beginning of Month, then the Number of Days calculation uses Computed Last Reprice Date in place of the Beginning of Month. In other words, the Number of Days equals Minimum (End of Month + 1, Computed Next Reprice Date) - Maximum (Beginning of Month, Computed Last Reprice Date).

- Repetition of steps 2 and 3 as necessary. In this example, only one iteration is needed because Prior LRD is less than the Beginning of the Month.
- Computation of the final transfer rate by weighting the results (from current and previous repricing periods) by average balances and days.

The calculation makes the following assumptions:

- CUR_TP_PER_ADB is the balance applying since the Last Reprice Date.
- PRIOR_TP_PER_ADB is the balance applying to all prior Repricing Periods.
- Application of the final transfer rate to the instrument record.

31.25 Unpriced Account

Under the Unpriced Account Method, the transfer rate for the account is defined as the Weighted Average of the Product Dimension Members. While using the unpriced account methodology, you can specify whether the Weighted Average of transfer rates has to be taken across all organizational units or for accounts only within that organizational unit.

Figure 31-25 Unpriced Account

The following options become available in the application with this method:

- **Add Dimension Values:** This allows you to select the Product Dimension Members whose Weighted Average Transfer Rate will be assigned to the product being defined.

Note:

You should not base an unpriced account on another unpriced account.

- **Across all Organization Units:** This allows you to specify whether the Weighted Average of transfer rates should be taken across all organizational units. If this option is not selected, the Weighted Average Rate will be calculated for each Org Unit. To calculate for each individual Org Unit, you must also select the Org Unit Dimension under Migration Dimensions in the Transfer Pricing Process.

 **Note:**

The Unpriced Account Method applies only to accounts that use the Ledger Table as their Data Source.

Users must provide assumptions on the Transfer Pricing Process, "Migration" Screen, choosing the applicable Dimensions, while using the Unpriced Account Method irrespective of Ledger Migration being selected or not.

If any Dimension is selected as Migration Dimension like GL Account ID, Weighted Average Rate would consider that too and WAR/Charge credit will only be calculated for combinations that are present in both Source and Target Product IDs'.

If Source and Target Product IDs' have different values for Migration Dimensions like GL Account ID, and then do not select that dimension (GL Account ID) as Migration Dimension."

For more information on Migration screen parameters, see the Transfer Pricing Process chapter.

31.26 Weighted Average Perpetual

This method calculates the simple Weighted Average of the applicable balance based on maturity bands defined through a Behavior Pattern. In the following example, the end-of-period balance as of Jan 31 is split into Core and Volatile strips, and the relevant rates are applied to arrive at the Weighted Average Transfer Rate.

Figure 31-26 Weighted Average Perpetual

▼ Transfer Pricing Method Mapping

Transfer Pricing Method	<input type="text" value="Weighted Average Perpetual"/>
Behavior Pattern	<input type="text"/>
Interest Rate Code	<input type="text"/>

Required

Table 7:

Table 31-12 BEHAVIORAL PATTERN: 20% 1 Month; 80% 3 Months

Run Date	EOP Balance	1M Strip	3M Strip	1M Rate	3M Rate	TP Rate
Jan 31	100000	20000	80000	3.10%	3.50%	3.42%
Feb 28	200000	40000	160000	3.25%	3.60%	3.53%
Mar 31	300000	60000	240000	3.20%	3.55%	3.48%

Transfer Rate = $(20000 \times 3.10\% + 80000 \times 3.50\%) / 100000 = 3.42\%$

- **Behavior Pattern:** Select the Behavior Pattern that is associated with the Product/Currency combination being defined.
- **Interest Rate Code:** Select the Interest Rate Code, which you want to use as the Transfer Pricing Yield Curve.

**Note:**

The Weighted Average Perpetual method applies to both Instrument Balances and Ledger Balances.

31.27 Working with Transfer Pricing Rules

The procedure for working with and managing the Transfer Pricing Rule is similar to that of other Oracle Funds Transfer Pricing Cloud Service 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 Cloud Service 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.

32

Adjustment Rules

Adjustment Rules allow you to specify methodologies to calculate Transfer Pricing add-on rates and breakage charges for the relevant products in your portfolio. The Standard Transfer Pricing Process references the methodologies contained in the Adjustments rule.

The procedure for working with and managing Adjustment rules is similar to that of other Oracle Funds Transfer Pricing business rules. It includes the following steps:

- Search Adjustment Rule. For more information, see the [Searching for Rules](#) section.
- [Create Adjustment Rules](#)
- View and Edit Adjustment Rule. For more information, see the [View and Edit the Rule](#) section.
- Copy Adjustment Rule. For more information, see the [Copy the Rule](#) section
- Delete Adjustment Rule. For more information, see the [Delete the Rule](#) section

As part of creating and editing Adjustment Rules, you define Adjustment Methodologies for applicable products.

- Defining Adjustment Methods
- Availability of Adjustment Methods
- Adjustment Method Parameters
- Procedure to Define the Formula Based Rate Adjustment Method

Oracle Funds Transfer Pricing 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

32.1 Create Adjustment Rules

You create an Adjustment Rule to define Adjustment Methodologies for your products.

To create the Adjustment Rule, follow these steps:

1. Navigate to Adjustment Rules Summary page.

Figure 32-1 Adjustment Rule - Definition Mode

2. Select the Adjustment Type from the Adjustment Type Selection section.

Figure 32-2 Adjustment Type Selection Page

3. Complete standard steps for this procedure.

32.2 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. You would start defining your adjustment assumptions for product-currency combinations before clicking Save.

To define an Adjustment Method, follow these steps:

- Perform the basic steps for creating or editing an Adjustment Rule.
- Populate the following details:

Table 32-1 Fields and Descriptions from the Adjustment Specification screen

Term	Definition
Reference Term	The associated term is 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), Remaining Term (the number of months until the account matures).
Interest Rate Code	Used for the Rate Lookup for the Formula Based Rate, and in the Breakage Charge - Economic Loss Method when discounting cash flows.
Assignment Date	Allows you to choose the date for which the yield curve values are to be sourced. Choices available are the As-of-Date, Last Repricing Date, TP Effective Date, Origination Date, Commitment Start Date, or Adjustment Effective Date.
Lookup Method	<p>The method used to derive an Add-on Rate for different reference term values.</p> <ul style="list-style-type: none"> • 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. <p>Deals that are outside of range or ranges will not be populated with any values.</p>
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 the 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.
Amount	The Add-on Amount to be applied to instruments where Reference Term is the product of Term and Multiplier defined for the row.
Formula	The mathematical formula used in the Formula Based Rate Adjustment Method to determine the Add-on Rate: (Term Point Rate * Coefficient) + Rate Spread.

Table 32-1 (Cont.) Fields and Descriptions from the Adjustment Specification screen

Term	Definition
Rate Floor and Rate Cap	The minimum and maximum rate. If the calculated value is less than the floor or more than the cap, then these rates will be applied. These boundaries are applicable only to Formula Based Method and Use the TP method from TP Rule Adjustment Method types. These are optional inputs. Ensure that the Rate Floor value is always less than or equal to the Rate Cap Value.
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 and Breakage Charge - Economic Loss Adjustment Methods. 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.
Minimum Charge	Used in the Fixed Percentage and Economic Loss Adjustment Methods for Breakage Charges. If the calculated Break Funding Amount is less than the Minimum Charge, then the Minimum Charge overrides the calculated amount and is written to the Break Funding Amount column.
Original Term	Select to apply Original Term to both Fixed and Adjustable Rate Instruments.
Standard Term	Standard Term is the traditional approach used in FTP, which is the original term for Fixed-Rate Instruments and Repricing Terms for Adjustable-Rate Instruments.
Repricing Frequency	Repricing Frequency is the frequency of rate change of a product.
Remaining Term	The remaining Term is the number of months remaining until the instrument matures.

32.2.1 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), or Breakage Charges. The following table describes the Adjustment Methods available for each of the Adjustment Types.

Figure 32-3 Adjustment Rule Definition - Adjustment Rule Details

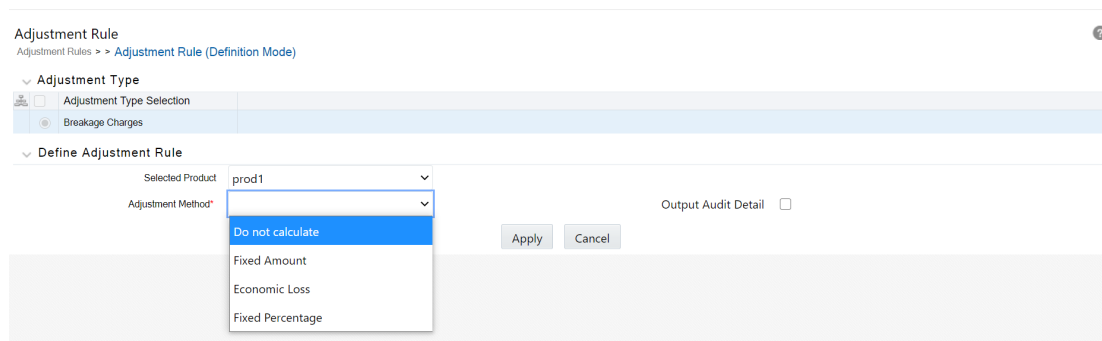


Table 32-2 Availability of Adjustment Methods

Adjustment Method	Adjustment Type: Add-On Rates (Liquidity Adjustments, Basis Risk Costs, Pricing Incentives, and Other Adjustments)	Adjustment Type: Breakage Charges
Do Not Calculate	Yes	Yes
Fixed-Rate	Yes	
Fixed Amount	Yes	Yes
Formula Based Rate	Yes	
Use TP Method from Selected TP Rule	Yes	
Economic Loss		Yes
Fixed Percentage		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's assumption.

32.2.1.1 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 32-3 Parameters Applicable to the Adjustment Methods for the Add-On Rate Adjustment Types

Adjustment Method	Reference Term	Lookup Method	Term	Multiplier	Rate	Amount	Assignment Date	Interest Rate Code	Formula
Do Not Calculate									
Fixed-Rate	Yes	Yes	Yes	Yes	Yes				
Fixed Amount	Yes	Yes	Yes	Yes		Yes			
Formula Based Rate	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Use TP Method from Selected TP Rule			Yes						



Note:

The Add-On Rate Adjustment Types include Liquidity Adjustments, Basis Risk Costs, Pricing Incentives, and Other Adjustments.

Table 32-4 Parameters Applicable to the Adjustment Methods for the Breakage Charge Adjustment Type

Adjustment Method	Break Funding Amount	Break Funding Rate	Interest Rate Code	Rate Spread	Minimum Charge
Do Not Calculate					
Fixed Amount	Yes				
Economic Loss			Yes	Yes	Yes
Fixed Percentage		Yes			Yes

To define the adjustment method parameters, follow these steps:

1. Perform the basic steps for creating or editing an Adjustment Rule. After you have created an Adjustments Rule, you can assign adjustment methodologies to product-currency combinations in either of the following ways:
 - By creating a conditional assumption using conditional logic.
 - Directly on the Adjustment Methodology page, as described here. To define an Adjustment Method, follow these steps:

- a. Navigate to the **Adjustments Assumption Browser** page.

Figure 32-4 Adjustment Rule - Edit Mode

Adjustment Rule
Assumption Specification > Adjustment Rule (Edit Mode)

Adjustment Rule

Name * WS_1
Description
Folder * PFTSEG Access Type * Read Only Read/Write

Product Hierarchy Selection
Folder * PFTSEG Product Hierarchy * test_hier

Currency Selection
Currency * US Dollar [US Dollar](#)

Adjustment Type Selection

Adjustment Type	Folder	Transfer Pricing Rule
<input type="checkbox"/> Basis Risk Costs	PFTSEG	TP_Undo_27744162
<input type="checkbox"/> Liquidity Adjustment	PFTSEG	lujy967

- b. Select an appropriate Adjustment Type: Liquidity Adjustment, Basis Risk Costs, Pricing Incentives, Other Adjustment, or Breakage Charge 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.

- c. Select a Product Hierarchy.
- d. Specify a Currency.
Based on the selected hierarchy, the application displays a list of all the products (for which you can define assumptions).
- e. Select the check box for one or more products for which you want to define adjustment details.
- f. Select an Adjustment Method and enter the appropriate parameters.

Figure 32-5 Adjustment Rule Definition Mode - Adjustment Rule Details

Adjustment Rule
Adjustment Rules > Adjustment Rule (Definition Mode) > Adjustment Rule Details

Adjustment Type
 Adjustment Type Selection
 Liquidity Adjustment

Define Adjustment Rule
Selected Product 1101 Term
Adjustment Method* Formula Based Rate Output Audit Detail

Formula Based Rate
Reference Term* Original Term Assignment Date*
Interest Rate Code* Lookup Method* Range Interpolation

Parameters

Operator	Term	Multiplier	Operator	Term	Multiplier	Formula	Rate Floor	Rate Cap
<input type="checkbox"/> >=		Months	<=		Months		-99.9999	99.9999

Apply Cancel

 **Note:**

The Adjustment Methods available depend on the Selected Adjustment Type. Depending on the Adjustment Type and Adjustment Method combinations selected, certain required and optional parameter fields are displayed. You can update these fields as required.

- g. 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 is 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.

Oracle Funds Transfer Pricing 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 set of products.

32.3 Define the Use TP Method from TP Rule Method

Defining the Use TP Method from the TP Rule Method involves the following additional steps:

1. Select the Adjustment Type from the Adjustment Type Selection shuttle box. From this list, you can select either Breakage Charge or any combination of other Adjustment Types.
Next to each Adjustment Type, you can select a Transfer Pricing Rule. This TP Rule will be used to refer to TP Methods if you are planning to use the "Use TP Method from TP Rule" option.
The list in the drop-down menu of Transfer Price Rules will be populated based on folder/product hierarchy selection.
2. Select a Currency, then select one or more Products from the hierarchy, and select the option to ADD assumption. This will take you to the Adjustment Rule Detail Page.
3. From the Adjustment Rule Detail Page, you must choose one of the Adjustment Methods from the following list:

 - Do not Calculate
 - Fixed-Rate
 - Fixed Amount

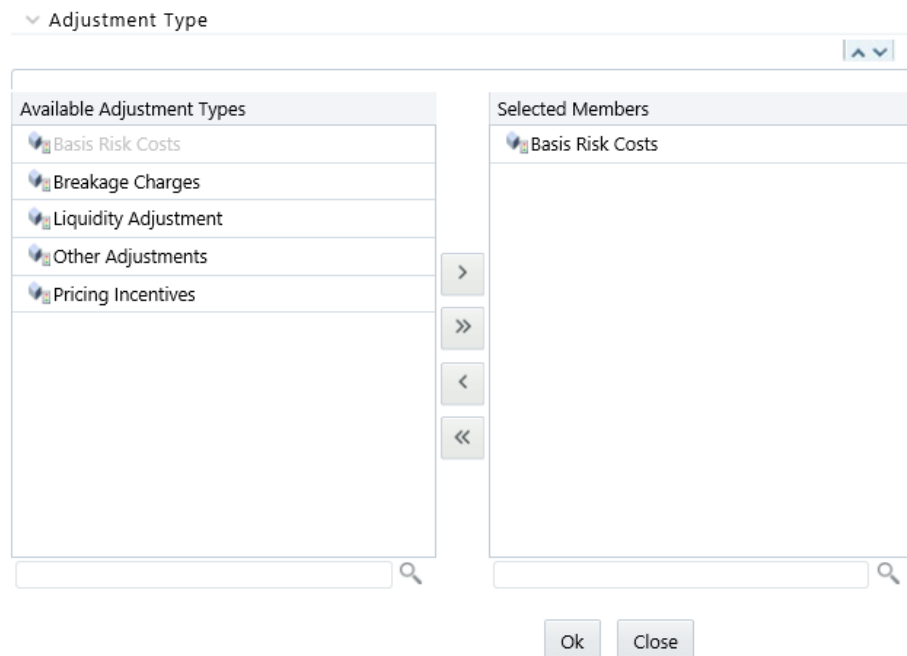
- Formula Based Rate
- Use TP Method from Selected TP Rule

 **Note:**

The option Use TP Method from Selected TP Rule will not be displayed if a TP Rule is not selected on the Summary Page. In addition, the selection of Term will be made available only when “Use TP Method from Selected TP Rule” is selected.

4. Select an option for Term from the following:
 - **Standard:** The cash flows will be generated as the normal case. That is the original term for Fixed-Rate Records and from the Last Reprice Date to the Next Reprice Date for Adjustable-Rate Instruments.
 - **Original Term:** All the cash flows generated to calculate the TP rate will be from the Origination Date to the Maturity Date. That is treating all the instruments as Fixed-Rate instruments.

Figure 32-6 Adjustment Type Selection



5. Select **Apply** to save the Adjustment Definition. When the FTP process encounters the "Use TP Method from Selected TP Rule" method, the engine will calculate the Adjustment Rate and based on the selected Adjustment Type will store the calculated value in one of the following columns (or other columns subject to Alternate Rate Output Mapping Definition):
 - Liquidity Adjustment: LIQUIDITY_PREMIUM_RATE
 - Basis Risk Adjustment: BASIS_RISK_COST_RATE

- Pricing Incentive Adjustment: PRICING_INCENTIVE_RATE
- Other Adjustment: OTHER_ADJUSTMENTS_RATE

The following are the exceptions and exclusions:

- This method is available for both Regular Adjustment definitions and Conditional Assumption Definitions. If conditional logic is defined in the TP Rule, then it will take precedence over any Conditional Logic defined in the Adjustment Rule.
- All TP Methods (Cash Flow and Non-Cash Flow Methods are supported) excluding the Caterpillar Method in conditional assumption as the standard practice for TP Rule Definition.
- If the TP Rule is not defined for other active currencies, but the user is trying to copy across using Adjustment Screen, then an alert message “Nothing to copy for currencies (list of currencies)” will be displayed.
- On selection of “Use TP Method from Selected TP Rule” as an Adjustment Method, any preset conditional assumptions on prod/ currency will be deleted as the conditional assumption is inherited from the TP Rule with a pop-up message “Selection of TP Method from TP Rule” will overwrite the conditional assumption with TP Rule Definition.
- Additional cash flows generated through the selection of the TP Method from the TP Rule will not be available for auditing in the FSI_O_Process_Cash_Flow Table.

32.3.1 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/ 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 32-7 Adjustment Rule Definition with Default Currency

Transfer Pricing Rules
Assumption Specification > Transfer Pricing Rules Definition (Edit Mode)

Transfer Pricing Rule

Name* ravi tp rule CF P

Description

Folder* PFTSEGE

Access Type* Read Only Read/Write

Product Hierarchy Selection

Folder* PFTSEGE

Product Hierarchy* test_hier

Currency Selection

Currency* Default Currency

US Dollar

Assumption Browser

Product	Transfer Pricing Method	Conditional Assumption	Status
<input type="checkbox"/> test_1			
<input type="checkbox"/> test_2008			
<input type="checkbox"/> test1013			
<input checked="" type="checkbox"/> Orphan Branch			

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 being 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.

32.3.2 Define the Formula Based Rate Adjustment Method

Defining the Formula Based Rate Adjustment Method involves the following additional steps:

Figure 32-8 Adjustment Rules Details - Formula Based Rate Definition

Adjustment Rule Details
[Adjustment Rules](#) > [Adjustment Rule \(Edit Mode\)](#) > [Adjustment Rule Details](#) > [Formula Based Rate Definition](#)

Interest Rate Code Term

Assumptions

Term Point Months Coefficient

Rate Spread

1. Select the Parameters row to update.
2. Click the Formula Based Rate Definition button to define the formula. The Formula Based Rate Definition Page is displayed.
3. Specify the Term Point, Coefficient, and Rate Spread in the Formula Based Rate Definition Page.

32.3.3 Define the Breakage Charge Economic Loss Method

Defining the Economic Loss Breakage Charge assumption requires the following additional steps:

Figure 32-9 Adjustment Rule Definition Mode - Adjustment Rule Details

1. Select the **Interest Rate Code** and **Rate Spread** to use for discounting the remaining term cash flows.
2. Select the minimum charge amount. Default to -99999 if you want to calculate both gains and losses.
3. Select the **TP Cash Flow Interest Type**. This interest rate will be used to generate interest cash flows.
4. Select the option to **Exclude Accrued Interest** if applicable.
5. Select the Interest Only option to discount only the Interest cash flows.
6. Select a **Holiday Calendar** if you want to adjust cash flows for Holidays and Weekends.
The default selection for Holiday Calendar is None. If this option is selected, then Holiday Calendar adjustments will not be applied to cash flow dates. If you wish to apply Holiday Calendar Adjustments, then select the appropriate Calendar.
7. Select the appropriate **Rolling Convention**. When Holiday Calendar has been selected in the preceding field, this drop-down list becomes active and contains 4 values:
 - Following Business Day
 - Modified following Business Day
 - Previous Business Day
 - Modified previous Business Day
8. Select the appropriate **Interest Calculation Logic** from the following:
 - Shift Dates Only
 - Recalculate Payment
9. Select **Apply**.

Transaction Strategies

With the Transaction Strategy Rules you can test the impact of various hedging strategies that are integrated with basic scenario modeling assumptions. This functionality supports you to test the alternative strategies and their incremental impact on results. The testing is facilitated by the separation of transaction strategies from basic scenario assumptions allows you to easily view the results with and without the incremental transaction(s). Use this Rule to add specific instrument records to a processing run without changing the actual instrument data.

A transaction is either positive or negative and can be defined for any product leaf member. A Transaction Strategy Rule is made up of any number of individual transactions.

Topics

- [Creating a Transaction Strategy Rule](#)
- [Defining a Transaction Strategy](#)

33.1 Creating a Transaction Strategy Rule

To create a new Transaction Strategy Rule, follow these steps:

1. Navigate to the **Transaction Strategies Summary** page and click **Add**.
2. In the Transaction Strategy Details page:
 - Enter the **Name**.
 - Enter the **Description**. This is an optional field.
 - Select a **Folder** and the **Access Type**.
3. In the Product Characteristics pane:
 - Select the Product Characteristics folder and assumption Rule from the drop-down list. For additional information on setting up and defining Product Characteristic Rules, See the Product Characteristics section.

 **Note:**

The Product Characteristics Rule that you select determines the hierarchy and available list of products for selection within the Transaction Strategy Rule. The dependent Product Characteristics Rule also provides default characteristics for any selected product. After defined the product, the red status box turns to green.

4. Select one of the four rate volume relationships. For more information and definitions, see the Rate Dependency Patterns. If any relationship is selected, select the desired Rate Dependency Pattern from the **Rate Dependency Pattern** drop-down list.

5. Click **Save** or continue to define Transaction Strategy details.

33.2 Defining a Transaction Strategy

To define a Transaction Rule, follow these steps:

1. To add a new transaction or instrument record to the Rule, click **Add**. A new row appears in the **Product and Currency** selection pane.
To delete a transaction or instrument record, check the box next to the product you want to delete and then click **Delete**.
2. After you add a new transaction row, navigate to **Product** column.
3. Click **Selector** icon to open the **Hierarchy Browser** and select a product leaf member. The currency code defaults to the currency defined in Application Preferences. For more information, see the **Application Preferences** section.
4. After adding the product and selecting appropriate product dimension member from the **HierarchyBrowser** to define the attributes for the transaction.
5. Based on the Product Members – Account Type attribute, you will be directed to either an **On-Balance Sheet Attribute** window or an **Off-Balance SheetAttribute** window.

On-Balance Sheet Attributes

The **On-Balance Sheet Attribute** window has following four tabs to define the strategy Rule for On-Balance Sheet transactions (non-derivative).

The last two bullets are optional based upon the product type definition in the first and second bullet.

- Define Core Product Attributes
- Define Payment Attributes
- Define Adjustable Rate Attributes
- Define Negative Amortization Attributes
- Define Other Mortgage Attributes*
- Define Inflation Adjustment Attributes**
- Define Tiered Interest Rate Attributes***

Note:

** This tab is displayed, if the **Inflation Indexed Instrument** option is selected on **Define Core Products Attributes** tab for New Business.

*** This tab is available if **Adjustable Type** is selected as **Tiered Balance Interest Rate** on **Define Core Products Attributes** tab.

Embedded Option Flag and Inflation Indexed Instrument flags cannot be selected together. If both are selected, then an error message is displayed “*Indexed Instrument does not support Embedded Option. Do you want to continue?*”.

Off-Balance Sheet Attributes

The **Off-Balance Sheet Attribute** window has following two tabs to define the strategy Rule for Off-Balance Sheet transactions.

- Define Core Product Attributes
- Define Leg Level Attributes: The Leg Attributes are separated into two subtabs:
 - Receiving Leg/IR CAP
 - Paying Leg/IR Floor

The values are populated with the default settings from the corresponding leaf member in the selected Product Characteristics Rule. You can modify them as required.

You can add as many transactions for any leaf member.

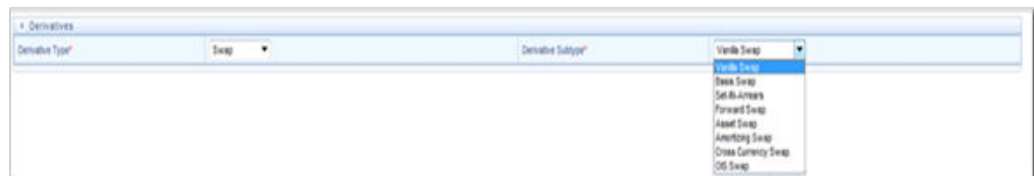
New Business in Bonds with Embedded Options is supported through the Transaction strategy. In the **Define Core products Attributes** tab of Transaction strategy definition, select the **Embedded Option** check box to define the Embedded Option new business rules.

33.2.1 Defining an Off-Balance Sheet Transaction

After selecting an Off-Balance Sheet product in the product and currency selection pane, define the characteristics of the transaction. To define the attributes of the transaction, follow these steps.

1. Select the check box next to the product and click **Define**.

Figure 33-1 List of Derivatives for defining an Off-Balance Sheet transaction



2. In the Derivatives pane, select the **Derivative Type** and **Derivative Subtype**. The following derivative types are available in Derivative Types drop-down list:

- Swap
- Option
- FX Contracts

The following derivative subtypes are available in Derivative Subtype drop-down list:

- If the Derivative Type is a **Swap**, select one of the seven swap types: **Vanilla**, **Basis**, **Set in Arrears**, **Forward**, **Asset**, **Amortizing**, or **Cross Currency**.
 - If the Derivative Type is an **Option**, select one of the three types: **Interest Rate Cap**, **Interest Rate Floor**, and **Interest Rate Collar**.
 - If the Derivative Type is **FX Contracts**, select subtype **Spot** or **Forward**.
3. Enter details in the **Core Products Attributes** tab and click **Save**.

Figure 33-2 Core Products Attributes tab for defining an Off-Balance Sheet transaction

- Depending on the relationship triggers on the type and subtype products, relevant fields are editable. For more information, see [Table 1](#).
 - Enter additional if required and click **Save**.
4. Enter details in the **Leg Attributes** tab and click **Save**.

Figure 33-3 Leg Attributes tab for defining an Off-Balance Sheet transaction

- **Receiving Leg / IR Cap** tab: Use this tab to define the Receiving Leg or the Cap Characteristics. The fields are editable based on the relationship triggers of the **Derivative Type** and **Derivative Subtype**. For FX Contracts Derivative type, **Receive Principal**, **pay Principal**, **Receive Currency**, and **Pay Currency** are mandatory fields.
 - **Paying Leg / IR Floor** tab: Use this tab to define the pay side, or the interest rate floor. The fields are editable based on the relationship triggers of the **Derivative Type** and **Derivative Subtype**.
5. After saving the attributes, if the definition is successful, then defined status turns to green.
6. A message is displayed to ask if you want to define another product/currency combination, click **Yes** to continue. Else, click **No** to go back to the **Transaction Strategies Summary** page.

33.2.2 Defining an On-Balance Sheet Transaction

After selecting an On-Balance Sheet product in the **Product** and **Currency**, define the characteristics of the transaction. To define the attributes of the transaction, follow these steps:

1. Select the check box next to the product.

Figure 33-4 Defining an On-Balance Sheet Transaction Rule

Active Time Bucket: TB_001
Assumption Specification > Transaction Strategies
Transaction Strategies
As Of Date: 06/25/2014

Transaction Strategy Details
Name * NewTS001
Description
Folder ALMSEG Access Type Read Only Read/Write

Product Characteristics
Folder ALMSEG Product Characteristics PC_00112

Product and Currency Selection *

Serial Number	<input type="checkbox"/>	Product	Currency	Rate Volume Relationship *	Rate Dependency Patterns *	Defined status
1	<input type="checkbox"/>	CASA_200	US Dollar	Rate-Spread Dependent	RDP_001123	<input checked="" type="checkbox"/>

Define

2. Enter details for the product and click **Define**.
The default information from the product definition appears in the **Core Attributes** tab, and the relationship triggers defines what input fields are necessary. For more information on product setup, see the Product Characteristics section.

Note:

For **Bermudan Exercise** type, provide multiple exercise dates and strike value

3. Enter details for **Define Core Products Attributes** tab and click **Save**.

Figure 33-5 Define Core Products Attributes tab for defining On-Balance Sheet transaction

Define Core Products Attributes | Define Payment Attributes | Define Adjustable Rate Attributes | Define Embedded Option

Amortization Type *	Non-Amortizing	Payment Pattern	
Adjustable Type *	Fixed Rate	Behavior Pattern	
Balance *		Repricing Pattern	
Deferred Balance		Lease Residual Value	0.0 %
Rate Pricing Option *		Amortization Method for Premiums, Discounts, Costs and Fees	Level Yield
Interest Rate Code		Origination Date *	
Gross Rate	%	Original Term *	Months
Net Rate	%	Amortization Term *	Months
Transfer Rate	%	Embedded Option Flag	<input checked="" type="checkbox"/>
Margin Type	<input checked="" type="radio"/> Rate <input type="radio"/> Percent		
Net Margin			
Gross Margin			
Inflation Indexed Instrument	<input type="checkbox"/>		

Save Cancel

Table 33-1 Core Product Attributes tab for defining On-Balance Sheet transaction – Fields and Descriptions

Field	Description
Amortization Type	<p>Method of amortizing principal and interest. This list consists of all standard OFSAA codes and all additional user-defined codes created through the Payment Pattern and Behavior Pattern interfaces, as follows:</p> <ul style="list-style-type: none"> • Conventional Fixed • Conventional Adjustable • Balloon Payment • Adjustable Negative Amortization • Non-Amortizing • Rule of 78's • Level Principal • Payment Pattern • Behavior Pattern • Lease <p>This field is not editable if the Derivative Type is selected as FX Contract and subtype is selected as Spot or Forward.</p>
Adjustable Type	<p>Determines the repricing characteristics of the new business record. This list consists of all standard OFSAA codes and all additional user-defined repricing patterns created through the Repricing Pattern interface. The codes are as follows:</p> <ul style="list-style-type: none"> • Fixed-Rate • Repricing Pattern • Floating Rate • Other Adjustable • Tiered Balance Interest Rate <p>When Adjustable Type Code is Fixed Rate, 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 are enabled in the Adjustable Rate Attributes tab.</p>
Balance	<p>Represents either the originating balance for transaction strategy records originating in the future or the current balance for transaction strategy records representing already originated accounts. If the Origination Date is in the past, the current balances are from the As Of Date.</p>
Deferred Balance	<p>Current Unamortized Deferred Balance associated with Instrument (such as, Premium, Discount, Fees, and so on.)</p>

Table 33-1 (Cont.) Core Product Attributes tab for defining On-Balance Sheet transaction – Fields and Descriptions

Field	Description
Rate Pricing Option	<p>This drop-down list has following two Rate Pricing options:</p> <p>Direct Input - This option allows you to input rates for new business in the Transaction Strategy.</p> <p>Assign During Processing: This option uses the Origination Date and Interest Rate Code (IRC) specified in the Transaction Strategy and pulls the corresponding rate from the Forecast Rates Assumption, that is, it is priced dynamically during the simulation.</p>
Interest Rate Code	<p>Defines the pricing index to which interest rate is contractually tied. The interest rate codes appears in Interest Rate Code drop-down list depending on the selected currency.</p>
Gross Rate	<p>Gross rate on the instrument (such as, paid by the customer).</p>
Net Rate	<p>The nominal interest rate on instrument owed to or paid by, the financial institution.</p>
Transfer Rate	<p>The associated Transfer Rate for the account.</p>
Margin Type	<p>The Margin Type can be selected as Rate or Percentage.</p> <ul style="list-style-type: none"> • Rate- By default, Rate is selected. This is a fixed spread. • Percent- Margin is calculated using the provided margin (as percent) and forecast rate. For example, if the forecast rate is 5% and the margin is 10%, then the margin calculated will be 10% of the forecasted rate. <p>For more information, see the OFS Cash Flow Engine Reference Guide.</p>
Net Margin	<p>The contractual margin over the interest rate code used in computing net rate. Gross margin minus any fees.</p>
Gross Margin	<p>Contractual spread over interest rate code used in the calculation of the gross rate.</p>
Payment Pattern	<p>You must select User-defined pattern if Payment Pattern is selected from the Amortization Type options. This field is not editable if the Derivative type is FX Contracts and subtype is selected Spot or Forward. For more information, see the Payment Pattern section.</p>

Table 33-1 (Cont.) Core Product Attributes tab for defining On-Balance Sheet transaction – Fields and Descriptions

Field	Description
Behavior Pattern	You must select User-defined pattern if Behavior Pattern is selected from the Amortization Type options. For more information, see the Behavior Pattern section.
Repricing Pattern	You must select User-defined pattern if Repricing Pattern is selected from the Adjustable Type options. For more information, see the Repricing Pattern section.
Amortization Method For Prem, Disc, Costs And Fees	Select Level Yield or Straight Line
Lease Residual Value	The residual value of a lease in the percentage of the original balance.
Origination Date	The date of the origination for the transaction account. This day can be in the future or the past.
Original Term	The contractual term at origination date in units (days, months, or years).
Amortization Term	Term upon which amortization is based in units (days, months, years). This field is not editable if the Derivative Type is selected as FX Contract and subtype is selected as Spot or Forward.
Embedded Option Flag	If an Embedded Option check box is selected, the Amortization Type must be non-amortizing. A warning message is displayed <i>Embedded Options only supported for non-amortizing instruments</i> . This check box enables the Define Embedded Options tab.
Inflation Indexed Instrument	Select this check box to make Inflation Indexed tab enabled.

 **Note:**

All fields with the red * are mandatory fields and must be populated.
Disabled check boxes cannot be edited.

4. Enter details for **Define Payment Attributes** tab and click **Apply**. The default information from the product definition appears in the payment attributes tab, and the relationship triggers defines what input fields are necessary. For more information on product setup, see Product Characteristics.

Figure 33-6 Define Payment Attributes tab for defining On-Balance Sheet transaction

Define Core Products Attributes	Define Payment Attributes	Define Adjustable Rate Attributes	Define Embedded Option
Payment Frequency *	0 Months	Accrual Basis *	None
Interest Type *	Interest In Arrears	Compounding Basis *	None
Holiday Calendar		Net Margin Flag *	
Rolling Convention	Unadjusted	Interest Calculation Logic	<input checked="" type="radio"/> Shift Dates Only <input type="radio"/> Recalculate Payment

Table 33-2 Define Payment Attributes tab for defining an on-balance sheet transaction – Fields and Descriptions

Fields	Description
Payment Frequency	Frequency of payment (P & I, Interest, or Principal) in units (days, months, or years). For bullet instruments, use zero. This field is not applicable if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Interest Type	Determines whether interest is calculated in arrears or advance or if the rate is set in arrears. Following three interest types are available: <ul style="list-style-type: none"> • Interest in Arrears • Interest in Advance • Set in Arrears For conventional amortization products, interest in arrears is the only valid choice. This field is not editable if Derivative type is FX Contracts and subtype is selected as Spot or Forward .
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. For more information, see the Holiday Calendar section.

Table 33-2 (Cont.) Define Payment Attributes tab for defining an on-balance sheet transaction – Fields and Descriptions

Fields	Description
Rolling Convention	<p>The default value is Unadjusted and is enabled, only when Holiday Calendar is selected. This drop-down list contains following values:</p> <ul style="list-style-type: none"> • Actual/Un-adjusted: Payment on the 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. <p>Many institutions have month-end accounting procedures to use this.</p>
Accrual Basis	<p>The basis on which the interest accrual on an account is calculated. This drop-down list has following options:</p> <ul style="list-style-type: none"> • 30/360 • Actual/360 • Actual/Actual • 30/365 • 30/Actual • Actual/365 • Business/252 <p>Note: A Holiday Calendar selection is required if the business/252 accrual basis is selected. Business/252 accrual basis is only applicable to the recalculate option of the Holiday Calendar Rule. If you select the shift payment dates, then payment is still recalculated for the non-holiday/weekend date.</p>

Table 33-2 (Cont.) Define Payment Attributes tab for defining an on-balance sheet transaction – Fields and Descriptions

Fields	Description
Compounding Basis	<p>Determines the number of compounding periods per payment period. This drop-down list has following options:</p> <ul style="list-style-type: none"> • Daily • Monthly • Quarterly • Semi-Annual • Yearly • Continuous • Simple • At Maturity
Net Margin Flag	<p>The setting of the Net Margin flag affects the calculation of Net Rate. This drop-down list has following options:</p> <p>Floating Net Rate - the net rate reprices in conjunction with the gross rate, at a value net of fees.</p> <p>Fixed Net Rate - the net rate equals a fixed fee equal to the net margin.</p> <p>This field is not applicable if the Derivative type is FX Contracts and subtype is selected Spot or Forward</p>

Table 33-2 (Cont.) Define Payment Attributes tab for defining an on-balance sheet transaction – Fields and Descriptions

Fields	Description
Interest Calculation Logic	<p>The following two options are available for Interest Calculation Logic:</p> <p>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.</p> <p>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. Also, the engine gets back on the scheduled track of payment events after a holiday event occurs in one (or many sequential) events.</p>

 **Note:**

All fields with the red * are mandatory fields and must be populated.
 Disabled check boxes cannot be edited.

5. Enter details in **Define Adjustable Rate Attributes** tab and click **Save**. This tab is used only if there is an adjustable or floating rate Product Characteristic that needs additional definition. The default values predefined by the product appears, and the irrelevant fields will be disabled based on the product type.

Figure 33-7 Define Adjustable Rate Attributes tab for defining On-Balance Sheet transaction

Define Core Products Attributes		Define Payment Attributes		Define Adjustable Rate Attributes		Define Embedded Option	
Repricing Frequency and Multiplier		Months	▼	Rate Increase Period			%
Tease Period		Months	▼	Rate Decrease Period			%
Tease Discount *		%		Minimum Rate Change			%
First Reset Cap		%		First Reset Floor			%
Rate Cap Life	0.000000	%		Rate Floor Life	0.000000		%
Rate Set Lag *		Months	▼	Rate Increase Life			%
Rate Change Rounding Factor		%		Rate Decrease Life			%
Rate Change Rounding Type *			▼				

Save Cancel

Table 33-3 Define Adjustable Rate Attributes tab for defining an On-Balance Sheet transaction – Fields and Descriptions

Fields	Description
Repricing Frequency And Multiplier	Contractual frequency of rate adjustment in units (days, months, or years).
Tease Period	The tease period frequency is used to determine the length of the tease period in units (days, months, or years).
Tease Discount	The tease discount is used in conjunction with the original rate to calculate the tease rate.
First Reset Cap	This is the initial maximum value for mortgage instruments that have a tease period. This cap rate will be applicable at the tease end period, prior to the first reset. After this, the periodic and lifetime cap value will be applied.
Rate Cap Life	Maximum rate allowed during the life of the instrument. This field is not editable (blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward . If the Derivative type is Interest Rate Cap or Collar, then this field stores the Cap or Strike Rate values.
Rate Set Lag	Period by which the payment recalculation lags the date of the interest rate used for calculation in units (days, months, or years). This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Rate Change Rounding Factor	Percent to which the rate change on an adjustable instrument is rounded. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .

Table 33-3 (Cont.) Define Adjustable Rate Attributes tab for defining an On-Balance Sheet transaction – Fields and Descriptions

Fields	Description
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. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Rate Increase Period	The maximum interest rate increase allowed during the cycle on an adjustable-rate instrument. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Rate Decrease Period	The maximum amount rate can decrease during the repricing period of an adjustable-rate instrument. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Minimum Rate Change	The minimum required change in rate on a repricing date. This field is not applicable if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
First Reset Floor	This is the initial minimum value for mortgage instruments that have a tease period. This floor rate is applicable at the tease end period, prior to the first reset. After this, the periodic and lifetime floor values are applied.
Rate Floor Life	The minimum rate for the life of the instrument. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward . If the Derivative type is Interest Rate Floor or Collar, then this field stores the Floor or Strike Rate values.
Rate Increase Life	The maximum interest rate increase allowed during the life of an adjustable-rate instrument. This is used to calculate rate cap based on forecasted rates scenario. If Rate Increase Life and Rate Cap are defined, then process uses the more restrictive rate. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Rate Decrease Life	The maximum amount rate can decrease during the life of an adjustable-rate instrument. This is used to calculate the rate floor based on the forecasted rate scenario. If Rate Decrease Life and Rate Floor are defined, then process uses the more restrictive rate. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .

 **Note:**

All fields with the red * are mandatory fields and must be populated. Disabled check boxes cannot be edited.

6. Enter details in the **Negative Amortization Attributes** tab and click **Save**. This tab is used only for a product with negative amortization characteristics that needs additional definition. The default values predefined by the product appears, and the irrelevant fields are disabled based on the product type. If the **Amortization Type** is not **Adjustable Negative Amount**, then all the fields are disabled.

Table 33-4 Define Negative Amortization Attributes tab for defining an On-Balance Sheet transaction – Fields and Descriptions

Fields	Description
Repricing Frequency And Multiplier	Contractual frequency of rate adjustment in units (days, months, or years).
TeasePeriod	The tease period frequency is used to determine the length of the tease period in units (days, months, or years).
Tease Discount	The tease discount is used in conjunction with the original rate to calculate the tease rate.
First Reset Cap	This is the initial maximum value for mortgage instruments that have a tease period. This cap rate will be applicable at the tease end period, prior to the first reset. After this, the periodic and lifetime cap value will be applied.
Rate Cap Life	Maximum rate allowed during the life of the instrument. This field is not editable (blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward . If the Derivative type is Interest Rate Cap or Collar, then this field stores the Cap or Strike Rate values.
Rate Set Lag	Period by which the payment recalculation lags the date of the interest rate used for calculation in units (days, months, or years). This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Rate Change Rounding Factor	Percent to which the rate change on an adjustable instrument is rounded. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
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. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .

Table 33-4 (Cont.) Define Negative Amortization Attributes tab for defining an On-Balance Sheet transaction – Fields and Descriptions

Fields	Description
Rate Increase Period	The maximum interest rate increase allowed during the cycle on an adjustable-rate instrument. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Rate Decrease Period	The maximum amount rate can decrease during the repricing period of an adjustable-rate instrument. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Minimum Rate Change	The minimum required change in rate on a repricing date. This field is not applicable if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
First Reset Floor	This is the initial minimum value for mortgage instruments that have a tease period. This floor rate is applicable at the tease end period, prior to the first reset. After this, the periodic and lifetime floor values are applied.
Rate Floor Life	The minimum rate for the life of the instrument. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward . If the Derivative type is Interest Rate Floor or Collar, then this field stores the Floor or Strike Rate values.
Rate Increase Life	The maximum interest rate increase allowed during the life of an adjustable-rate instrument. This is used to calculate rate cap based on forecasted rates scenario. If Rate Increase Life and Rate Cap are defined, then process uses the more restrictive rate. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .
Rate Decrease Life	The maximum amount rate can decrease during the life of an adjustable-rate instrument. This is used to calculate the rate floor based on the forecasted rate scenario. If Rate Decrease Life and Rate Floor are defined, then process uses the more restrictive rate. This field is not editable(blank) if the Derivative type is FX Contracts and subtype is selected Spot or Forward .

 **Note:**

All fields with the red * are mandatory fields and must be populated.
Disabled check boxes cannot be edited.

7. Enter details in the **Other Mortgage Attribute** tab and click **Save**.
This tab is available only if you are mapped to the ADCo LDM function.
8. Enter details in the **Inflation Adjustment Attributes** tab and click **Save**.
This tab is available when **Inflation Indexed Instrument** check box is selected on **Define Core Products Attributes** tab. The fields on this tab are used to enter Inflation Indexed details.

For more information on the cash flow calculations associated with Inflation indexed instrument, see the Oracle Financial Services Cash Flow Engine Reference Guide.
9. Enter details in the **Tiered Interest Rate Attributes** tab and click **Save**.
This tab is available if **Adjustable Type** is selected as **Tiered Balance Interest Rate** on **Define Core Products Attributes** tab. This tab includes the details for Tiered Balance Interest Rate that can be used during the ALM processing. For more information, see the ALM Processing section.
10. After saving the attributes, if the definition is successful, then defined status turns to green.
11. A message is displayed to ask if you want to define another product/currency combination, click **Yes** to continue. Else, click **No** to go back to the **Transaction Strategies Summary** page.

Formula Results

This module describes the procedure for working with and managing Formula Results rules.

The Formula Results rule enables you to model a product/currency leaf using the results of the cash flow, Liquidity Gap, Repricing Gap, and Market Value processes to recalculate and change the system-generated data. This allows you to model a product/currency leaf beyond results produced by the cash flow engine, using the formulas to create financial element values. The new FEs will be displayed to you, based on the Financial Type selection.

The types of Formula Results are following:

- Cash Flow
- Repricing Gap
- Liquidity Gap
- Market Value

**Note:**

The Formula Result assumptions are applicable only for Deterministic Process. Only leaf level assumptions will be supported. Default currency and Preview options are not available in UI.

Here, engine picks up the assumptions and writes the results into the Result Detail and Result Master tables (including all the forecast rates scenarios). Process Cash Flows table is not populated. Consolidated Detail and Consolidated Master tables are populated with Formula Results for Result Type Code=2 (indicating Formula Results Data) if the Consolidation flag is selected.

The Formula Results rule works only for the first dynamic start date for IRR Gap and liquidity buckets, and for As of Date (Start Date Index=0) and all the dynamic start dates for Market Value.

**Note:**

Auto balancing has result type code 3, so the Auto balancing will be applicable post Formula Results are applied.

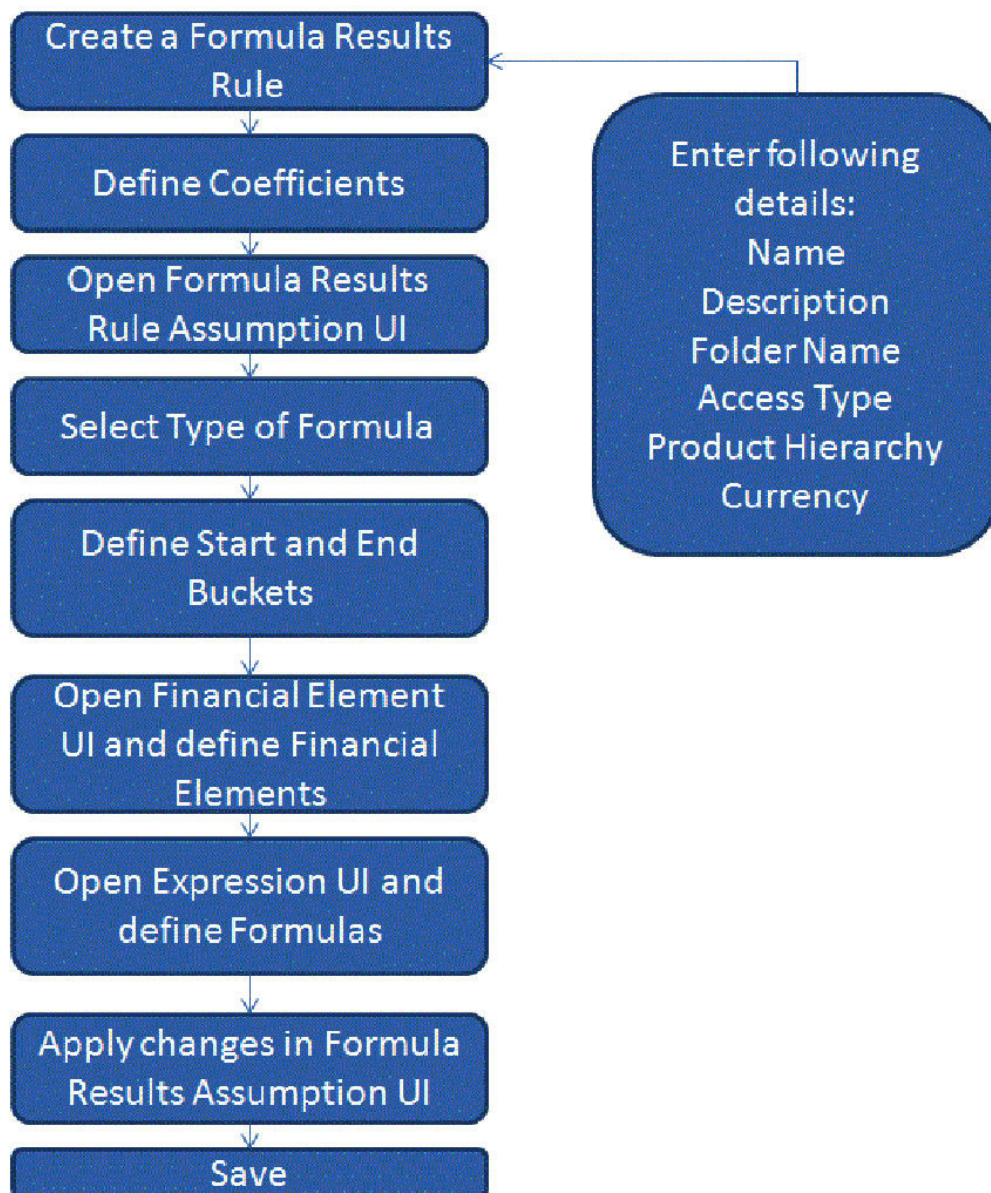
The procedure for working with and managing Formula Results rules is similar to that of other Oracle Asset Liability Management business rules. It includes the following steps:

- Searching for Formula Results rules. For more information, see [Searching for Rules](#) section.
- Creating Formula Results Rules. For more information, see [Creating Rules](#) section.

- Viewing and Editing Formula Results rules. For more information, see [View and Edit the Rule](#) section.
- Copying Formula Results rules. For more information, see [Copy the Rule](#) section.
- Deleting Formula Results rules. For more information, see [Delete the Rule](#) section.

As part of creating and editing Formula Results rules, you can assign Formula Results to applicable products.

Figure 34-1 Process Flow of Formula Results



34.1 Creating Formula Result Rules

You can create a Formula Results rule to use the results of the Cash Flow, Gap, and Market Value processes to recalculate and change system-generated data and to use the Formulas to create the financial element values.

To create a new Formula Results Rule, follow these steps:

1. Navigate to the **Formula Results** summary page and click **Add**.

Figure 34-2 Formula Results Summary page

Name	Creation Date	Created By	Last Modification Date	Last Modified By	Access Type
<input type="checkbox"/> FR_001	05/31/2021 18:30:27	ALMUSER	05/31/2021 18:30:27	ALMUSER	Read/Write

2. Complete standard steps for this procedure.

Note:

In addition to the standard steps for creating rules, the procedure for creating a Formula Results rule involves one extra step. After Standard Step 6, you need to select a product hierarchy.

34.2 Defining Formula Results Rules

The definition of a Formula Results rule is part of the Create or Edit Formula Results rule process. When you click Save in the Create Formula Results rule process, the rule is saved and the Formula Results rule summary page is displayed. However, Formula Results assumptions have not yet been defined for any of your products at this point. Typically, you would start defining your Formula Result assumptions for product-currency combinations before clicking **Save**.

You can define the Formula Results rule only at leaf level of the Product dimension hierarchy.

Figure 34-3 Defining Formula Results Rules

Prerequisites

Performing basic steps for creating or editing a Formula Results rule

To define a Formula Result rule, follow these steps:

Step 1:

From the Assumption Browser screen, select the product(s) and the currency for which you want to define a Formula Result. Define the coefficients. Click **Add** from Assumption browser to launch the Formula Results Details window.

Defining Formula Results rule has four primary steps:

1. Choosing type of Formula Result
2. Defining Formula Result assumption bucket range
3. Selecting the Financial Element
4. Defining the new Formula.

Step 2:

Defining Coefficients

This UI allows you to define the coefficients for buckets.

1. Select Define Coefficients button from Formula Results screen.
2. Select the type of Formula Result. It can be:

Figure 34-4 Defining Formula Results Rules

- Cash Flow
- Repricing Gap
- Liquidity Gap
- Market Value

3. Enter details in Start Bucket and End Bucket fields. The bucket number input allows you to select a range of buckets over which the Formula Results assumption will apply. The Bucket numbers are automatically updated in Coefficients field based on the Bucket Number input.

Step 3:

Enter the Code, Description, and Bucket details. You can add a new row using the **Add** icon.

Following four Formula types are available

- Cash Flow
- Repricing Gap
- Liquidity Gap
- Market Value

The list of Financial Elements are grouped in above mentioned types.

Table 34-1 Form fields to Define a new formula in Formula Result rule

Fields	Description
Start Bucket and End Bucket	The bucket number input allows you to select a range of buckets over which the Formula Results assumption will apply. The Bucket numbers are updated automatically based on the Bucket Number input.
Formula Bar	The Formula Bar allows you to enter a new formula for a selected bucket. You can also edit the formula here which is defined using the Formula Bar or Formula Input Lanucher. Here, you can view the complete formula if it is not readable in bucket field.

Table 34-1 (Cont.) Form fields to Define a new formula in Formula Result rule

Fields	Description
Financial Elements selection	The Financial Elements selection section allows you to select the Financial Element for defined buckets. The number of buckets can be defined using the Start Bucket and End Bucket. You can add multiple Financial Elements. Each row represents to a Financial Element. All the Financial Elements will be logically grouped in Financial Type.

Step 4:

To add a Financial Element, follow the steps given below:

1. Click **Add**.
2. Select the **Financial Type** from **Financial Element** window.
3. Select Financial Element and click **Apply**.

34.2.1 Formula Expression block

This window allows you to define a Formula. This section has the list of all Financial Elements/Interest Rate Codes, Functions, and Operators, which you can use to define a Formula.

You can also use the custom functions in Formula Expression window. To use a custom function, type the name of function in Formula Expression window.

A custom function is defined using the PL/SQL that returns a number not exceeding the precision of NUMBER(15,2). Compile this function directly within the database schema. You can use any parameter as required and that will be captured as part of the Formula expression itself.

The following **Utility** functions/procedures within the package ALM_FORMULA_RESULT_HELPER can be accessed in the custom functions. Then, these can be used as per the requirements/objectives.

Table 34-2 List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
Function	getBucket-ColumnName	getBucket-ColumnName (Lag NUMBER)	Column-Name – VARCHAR2	Returns the column-name in RES_DTL_XXXX corresponding to the Lag specified;

Table 34-2 (Cont.) List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
				<p>The lag is offset against the current bucket against which the expression has been defined.</p> <p>Exception(s) thrown:</p> <p>INVALID_NEGATIVE_LAG if Current Bucket + Lag <= 0</p> <p>INVALID_POSITIVE_LAG if Current Bucket + Lag > 240</p>
Procedure	LOGMESSAGE	LOGMESSAGE (Message VARCHAR2)	-N.A.-	<p>Logs a message into the FSI_PROCESS_ERRORS table</p> <p>Note: Procedure does an autonomous_transaction based commit.</p>
Function	getCoefficient	getCoefficient (COEFF NUMBER, LAG NUMBER, FR_TYPE NUMBER)	Coefficient value – NUMBER	<p>Returns the coefficient corresponding to the coefficient code, Lag and Formula-type.</p> <p>Available Formula-types are</p> <p>FR_CASH_FLOW_TYPE = 1</p> <p>FR_REPRICING_Gap_TYPE = 2</p> <p>FR_LIQUIDITY_Gap_TYPE = 3</p> <p>FR_MARKET_VALUE_TYPE = 4</p> <p>Exception(s) thrown:</p>

Table 34-2 (Cont.) List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
				INVALID_NEGATIVE_LAG if Current Bucket + Lag <= 0
				INVALID_POSITIVE_LAG if Current Bucket + Lag > 240
				NO_DATA_FOUND exception if no data found for the given inputs
Procedure	AssertCash-FlowFE	AssertCash-FlowFE(fe_num number)	-N.A.-	Asserts if the FE-Number is a cash-flow-FE. Exception(s) thrown
				NOT_A_CASH_FLOW_FE if FE_NUM is not a valid FE
Procedure	AssertStaticFE	AssertStaticFE(fe_num number)	-N.A.-	Asserts if the FE-Number is a Static-FE. Exception(s) thrown
				NOT_A_STATIC_FE if FE_NUM is not a valid FE
Function	getStaticColumnName	getStaticColumnName(fe_num number)	Column-Name – VARCHAR2	Returns the column-name in FSI_O_RESULT_MASTER / FSI_O_CONSOLIDATED_MASTER corresponding to the FE-Number specified Exception(s) thrown
				NOT_A_STATIC_FE if FE_NUM is not a valid FE

Table 34-2 (Cont.) List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
Function	getFilter	getFilter()	WHERE_CLAUSE VARCHAR2	<p>Returns the WHERE-CLAUSE that can be applied on RES_DTL/CONS_DTL and/or FSI_O_RESULT_MASTER/FSI_O_CONSOLIDATED_MASTER.</p> <p>NOT_A_STATIC_FE if FE_NUM is not a valid FE</p> <p>This clause contains filters applied on each of the relevant columns upon which the expression has been defined in Formula results.</p>
Procedure	Evaluate	evaluate(pBatchRunId varchar2, pAsOfDate varchar2, pProcessSysID number)	-N.A.-	<p>Evaluate Formula Results assumption for given process-id.</p> <p>Useful if the CFE Processing has already been completed and the need is to only evaluate the Formula Results assumption.</p> <p>Note: Do not invoke this procedure within a custom function that is embedded within an FR Expression.</p>

Table 34-2 (Cont.) List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
				pBatchRunId is a key used to uniquely identify an execution of a batch / job
				pAsOfDate should be passed in the format YYYYMMDD

The following **Utility** variables within the package ALM_FORMULA_RESULT_HELPER can be accessed in the custom functions. Then, these can be used as per the requirements/objectives.

List of Variables used in Defining Custom Functions

Variable Name	Data Type	Purpose
RESULT_TABLE	VARCHAR2	Holds the Result-detail table-name i.e. RES_DTL_XXXX
MASTER_TABLE	VARCHAR2	Holds the result-Master table-name i.e. FSI_O_RESULT_MASTER
CURRENT_ALM_PROCESS_SYS_ID	NUMBER	Holds the Process-Sys-Id of the current execution
CURRENT_AS_OF_DATE	DATE	AS-OF-DATE for which the Formula Result is being evaluated
ALM_PROC_EXEC_DATE_YYYYMMDD	VARCHAR2	AS-OF-DATE for which the Formula Result is being evaluated in the format YYYYMMDD
CURRENT_SCENARIO	NUMBER	The current forecast-rate scenario number for which the expression is being evaluated.
CURRENT_TIME_BUCKET	NUMBER	The Time Bucket SYS-ID for which the expression is being evaluated.
CURRENT_START_DATE_INDEX	NUMBER	The current Start-date-index number for which the expression is being evaluated.
CURRENT_BUCKET	NUMBER	The bucket-number for which the expression is being evaluated

Variable Name	Data Type	Purpose
CURRENT_PRODUCT	NUMBER	The Product-Id for which the expression is being evaluated
CURRENT_LEG_TYPE	NUMBER	The leg-type for which the expression is being evaluated
CURRENT_ORG_UNIT	NUMBER	The Org-Unit-Id for which the expression is being evaluated
CURRENT_LEGAL_ENTITY	NUMBER	The Legal-Entity Id for which the expression is being evaluated
CURRENT_CURRENCY	VARCHAR2	The Currency for which the expression is being evaluated
ALM_PROCESS_REPORTING_CURRENCY	VARCHAR2	The reporting currency currently set for the process-sys-id
ALM_PROCESS_EXECUTED_BY	VARCHAR2	The AAI user-id who last executed the process for the given as-of-date
ALM_BATCH_RUN_ID	VARCHAR2	The Batch Run-ID i.e. unique execution identifier for the current execution
PRODUCT_DIMENSION_COLUMN_NAME	VARCHAR2	The active product dimension in use for the current execution
ORG_UNIT_DIMENSION_COLUMN_NAME	VARCHAR2	The active Org-Unit dimension in use for the current execution

34.3 Defining a Formula Results Rule: An Example

To define a Formula Results rule, follow below steps:

1. From the Assumption Browser, select Currency (US Dollar) and a product from the hierarchy browser
2. Click the **Add** icon to enter the Assumption Details page.
3. Select the type of Formula as Cash Flow, Repricing Gap, Liquidity Gap, or Market Value option.
4. Define the Formula Result Bucket range using the Start Bucket and End Bucket options.
5. Click **Add Financial Elements** icon on **Formula Results Details** window to select the Financial Elements. The **Financial Elements** window is displayed. Here, all the Financial Elements are grouped in Financial Types.
6. Select the Financial Type. Based on the selected Financial Type, the list of Financial Elements will be displayed. Select the Financial Element and click Apply. You can select multiple Financial Elements at a time. The selected Financial Elements will be displayed on Formula Results Details screen.
7. Select the Bucket for which you want to define a new Formula. For each Bucket, you can define a different formula that will be applicable only for corresponding bucket. Here, you

can define the formula in each bucket(s) for Financial Element using the Formula Bar or Formula Input Lanucher.

8. You can enter a formula directly in Formula Bar.
9. Click **Formula Input Launcher** icon to enter the details of Formula.
10. In the **Expression** window, select the Financial Element/Interest Code, Functions, and Operators to define the Formula.
For more information on Functions, see Formula Results Functions section.
11. After saving the Formula, you will be directed back to Formula Result Details page.
12. Select Apply to commit the assumption and return to the Assumption Browser page. You can select more than one product at a time from the **Assumption Browser** page.

You can also use the **Excel Import/Export** feature to import the Buckets/Financial Element information in the **Formula Results - Financial Elements** tab.

When Formula Result assumptions are defined for all required product / currency combinations, click **Save** from the **Assumption Browser** page.

34.4 Formula Results Functions

Formula Results Rule has its own unique functions which allows the user to access the various financial elements.

The following table can be used as a quick reference guide for the Formula Results functions.

Table 34-3 List of Formula Results Functions

Function FE Financial Element	Formula	Use in Cash Flow	Use in Gap	Use in MV
Cash Flow FE	FE(Leaf, FE, Lag)	Yes	Yes	No
Current Leaf FE	CLFE (FE, Lag)	Yes	Yes	No
Static FE	SFE(Leaf,FE)	No	No	Yes
Static Current Leaf FE.	SCLFE(FE)	No	No	Yes
Cash Flow Coefficient	K(Coeff, Lag)	Yes	No	No
IRR Gap Coeffi- cient	IGK(Coeff, Lag)	No	Yes	No
Liq Gap Coeffi- cient	LGK(Coeff, Lag)	No	Yes	No
Static Coefficient	SK(Coeff)	Yes	Yes	Yes
Rate	RT(IRC, Lag, Term, Mult)	Yes	No	No
Days in Bucket	DAYS(Bucket)	Yes	No	No

Table 34-3 (Cont.) List of Formula Results Functions

Function FE Financial Element	Formula	Use in Cash Flow	Use in Gap	Use in MV
Month of the Bucket	MONTH()	Yes	No	No

34.4.1 Formula Expression block

This window allows you to define a Formula. This section has the list of all Financial Elements/Interest Rate Codes, Functions, and Operators, which you can use to define a Formula.

You can also use the custom functions in Formula Expression window. To use a custom function, type the name of function in Formula Expression window.

A custom function is defined using the PL/SQL that returns a number not exceeding the precision of NUMBER(15,2). Compile this function directly within the database schema. You can use any parameter as required and that will be captured as part of the Formula expression itself.

The following **Utility** functions/procedures within the package ALM_FORMULA_RESULT_HELPER can be accessed in the custom functions. Then, these can be used as per the requirements/objectives.

Table 34-4 List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
Function	getBucket- ColumnName	getBucket- ColumnName (Lag NUMBER)	Column-Name – VARCHAR2	Returns the column-name in RES_DTL_XXXXX corresponding to the Lag specified; The lag is offset against the current bucket against which the expression has been defined. Exception(s) thrown: INVALID_NEGATIV E_LAG if Current Bucket + Lag <= 0 INVALID_POSITIV E_LAG if Current Bucket + Lag > 240

Table 34-4 (Cont.) List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
Procedure	LOGMESSAGE	LOGMESSAGE (Message VARCHAR2)	-N.A.-	<p>Logs a message into the FSI_PROCESS_ERRORS table</p> <p>Note: Procedure does an autonomous_transaction based commit.</p>
Function	getCoefficient	getCoefficient (COEFF NUMBER, LAG NUMBER, FR_TYPE NUMBER)	Coefficient value – NUMBER	<p>Returns the coefficient corresponding to the coefficient code, Lag and Formula-type.</p> <p>Available Formula-types are</p> <p>FR_CASH_FLOW_TYPE = 1</p> <p>FR_REPRICING_Gap_TYPE = 2</p> <p>FR_LIQUIDITY_Gap_TYPE = 3</p> <p>FR_MARKET_VALUE_TYPE = 4</p> <p>Exception(s) thrown:</p> <p>INVALID_NEGATIVE_LAG if Current Bucket + Lag <= 0</p> <p>INVALID_POSITIVE_LAG if Current Bucket + Lag > 240</p> <p>NO_DATA_FOUND exception if no data found for the given inputs</p>
Procedure	AssertCashFlowFE	AssertCashFlowFE(fe_number)	-N.A.-	<p>Asserts if the FE-Number is a cash-flow-FE.</p> <p>Exception(s) thrown</p>

Table 34-4 (Cont.) List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
Procedure	AssertStaticFE	AssertStaticFE(fe_num number)	-N.A.-	<p>NOT_A_CASH_FLOW_FE if FE_NUM is not a valid FE</p> <p>Asserts if the FE-Number is a Static-FE.</p> <p>Exception(s) thrown</p>
Function	getStaticColumnName	getStaticColumnName(fe_num number)	Column-Name – VARCHAR2	<p>NOT_A_STATIC_FE if FE_NUM is not a valid FE</p> <p>Returns the column-name in FSI_O_RESULT_MASTER / FSI_O_CONSOLIDATED_MASTER corresponding to the FE-Number specified</p> <p>Exception(s) thrown</p>
Function	getFilter	getFilter()	WHERE_CLAUSE VARCHAR2	<p>NOT_A_STATIC_FE if FE_NUM is not a valid FE</p> <p>Returns the WHERE-CLAUSE that can be applied on RES_DTL/ CONS_DTL and/or FSI_O_RESULT_MASTER/ FSI_O_CONSOLIDATED_MASTER.</p> <p>NOT_A_STATIC_FE if FE_NUM is not a valid FE</p>

Table 34-4 (Cont.) List of Functions and Procedures used in Defining Custom Functions

Type	Name	Usage	Output Parameter(s)	Comments
				This clause contains filters applied on each of the relevant columns upon which the expression has been defined in Formula results.
Procedure	Evaluate	evaluate(pBatchRunId varchar2, pAsOfDate varchar2, pProcessSysID number)	-N.A.-	<p>Evaluate Formula Results assumption for given process-id.</p> <p>Useful if the CFE Processing has already been completed and the need is to only evaluate the Formula Results assumption.</p> <p>Note: Do not invoke this procedure within a custom function that is embedded within an FR Expression.</p> <p>pBatchRunId is a key used to uniquely identify an execution of a batch / job</p> <p>pAsOfDate should be passed in the format YYYYMMDD</p>

The following **Utility** variables within the package ALM_FORMULA_RESULT_HELPER can be accessed in the custom functions. Then, these can be used as per the requirements/objectives.

List of Variables used in Defining Custom Functions

Variable Name	Data Type	Purpose
RESULT_TABLE	VARCHAR2	Holds the Result-detail table-name i.e. RES_DTL_XXXX
MASTER_TABLE	VARCHAR2	Holds the result-Master table-name i.e. FSI_O_RESULT_MASTER
CURRENT_ALM_PROCESS_SYS_ID	NUMBER	Holds the Process-Sys-Id of the current execution
CURRENT_AS_OF_DATE	DATE	AS-OF-DATE for which the Formula Result is being evaluated
ALM_PROC_EXEC_DATE_YYYYMMDD	VARCHAR2	AS-OF-DATE for which the Formula Result is being evaluated in the format YYYYMMDD
CURRENT_SCENARIO	NUMBER	The current forecast-rate scenario number for which the expression is being evaluated.
CURRENT_TIME_BUCKET	NUMBER	The Time Bucket SYS-ID for which the expression is being evaluated.
CURRENT_START_DATE_INDEX	NUMBER	The current Start-date-index number for which the expression is being evaluated.
CURRENT_BUCKET	NUMBER	The bucket-number for which the expression is being evaluated
CURRENT_PRODUCT	NUMBER	The Product-Id for which the expression is being evaluated
CURRENT_LEG_TYPE	NUMBER	The leg-type for which the expression is being evaluated
CURRENT_ORG_UNIT	NUMBER	The Org-Unit-Id for which the expression is being evaluated
CURRENT_LEGAL_ENTITY	NUMBER	The Legal-Entity Id for which the expression is being evaluated
CURRENT_CURRENCY	VARCHAR2	The Currency for which the expression is being evaluated
ALM_PROCESS_REPORTING_CURRENCY	VARCHAR2	The reporting currency currently set for the process-sys-id
ALM_PROCESS_EXECUTED_BY	VARCHAR2	The AAI user-id who last executed the process for the given as-of-date
ALM_BATCH_RUN_ID	VARCHAR2	The Batch Run-ID i.e. unique execution identifier for the current execution
PRODUCT_DIMENSION_COLUMN_NAME	VARCHAR2	The active product dimension in use for the current execution

Variable Name	Data Type	Purpose
ORG_UNIT_DIMENSION_ COLUMN_NAME	VARCHAR2	The active Org-Unit dimension in use for the current execution

34.4.2 Detailed Descriptions

FE (Leaf,FE,Lag)

Used in cash flow and Gap Formulas only

The FE function returns the value of the Financial Element for the Leaf specified as stored in the Cash Flow results table.

Syntax:

Table 34-5 FE Function details

Where	FE	Function Name
	LEAF	Dimension number of applicable hierarchy. If the leaf value is greater than nine digits, it must be input with a decimal point or the answer will return zero. (Example: Leaf value 123456789012345 returns a 0 value. Leaf 123456789012345.00 returns an accurately calculated value.)
	FE	Financial Element Code number (see table above)
	Lag	Relative to Formula Results Rule buckets. May be positive or negative. 0 = Current bucket -1 = Previous Bucket 1 = Next bucket etc.

If the leaf value is the same as the formula leaf you are modeling, it will read what was in the Cash Flow results table before processing the formula leaf you are processing. To access the values as they change during the calculation, use CLFE

Note:

To access the results from multiple leaves, you must add together multiple FE functions (e.g. FE(995,100,0) + FE(996,100,0) +...)

CLFE (FE,Lag)

Used in Cash Flow and Gap Formulas only

The CLFE Function returns the value of the financial element of the current leaf in memory. This function allows you to use the result of a prior calculation within the Formula Results Rule which does not reside in the Cash Flow Results table. CLFE differs from FE (same leaf) because it accesses the computed value of the financial element, not what was in the results table when processing began

Syntax:

Table 34-6 CLFE Function Details

Where	CLFE	Function Name
	Lag	Relative to Formula Results Rule buckets. May be positive or negative. 0 = Current bucket -1 = Previous Bucket 1 = Next bucket etc.

K (Coeff,Lag)

Used in Cash Flow Formulas only

The K Function allows the use of a user defined coefficient to be used in the formulas. Coefficients may be defined for each individual modeling bucket. This feature provides for ease of use and flexibility in building of Formula Results Rule formulas.

Syntax:

Table 34-7 K Function details

Where	K	Function Name
	Coeff	User defined Coefficient Code number
	Lag	Relative to Coefficient defined buckets 0 = Current bucket -1 = Previous Bucket 1 = Next bucket etc.

SFE (Leaf,FE)

Used in Market Value Formulas only

The SFE function Returns the value of the Financial Element of the Leaf specified as stored in the Results_Master table.

If the leaf value is the same as the formula leaf you are modeling, it will read what was in the Cash Flow Results table before processing the formula leaf you are processing. To access the values as they change during the calculation, use SCLFE.

Syntax:

Table 34-8 SFE Function details

Where	SFE	Function Name
	LEAF	Dimension number of applicable hierarchy. If the leaf value is greater than nine digits, it must be input with a decimal point or the answer will return zero. (Example: Leaf value 123456789012345 returns a 0 value. Leaf 123456789012345.00 returns an accurately calculated value.)



Note:

To access the results from multiple leaves, you must add together multiple SFE functions (e.g. SFE(995,2001) + SFE(996,2001) +...)

SCLFE (FE)

Used in Market Value Formulas Only

The SCLFE Function returns the value of the financial element of the current leaf in memory. This function allows you to use the results of a prior calculation within the Formula Results Rule which may not reside in the results table. It differs from SFE (same leaf) because it accesses the computed value of the financial element, not what was in the results table when processing began.

Syntax

Table 34-9 SCLFE Function details

Where	SCLFE	Function Name
	FE	Financial Element Code number (see table above)

IGK(Coeff, Lag)

Used in Gap Formulas only

IRR Gap Coefficient function allows the use of a user defined coefficient to be used in the formulas. Coefficients may be defined for each individual Gap bucket. This feature provides for ease of use and flexibility in building of Formula Results Rule Formula.

Syntax:

Table 34-10 IGK Function details

Where	IGK	Function Name
	Coeff	User defined Coefficient Code number
	Lag	Relative to Coefficient defined buckets 0 = Current bucket -1 = Previous Bucket 1 = Next bucket etc.

LGK(Coeff, Lag)

Used in Gap Formulas only.

Liquidity Gap Coefficient function allows the use of a user defined coefficient to be used in the formulas. Coefficients may be defined for each individual Gap bucket. This feature provides for ease of use and flexibility in building of Formula Results Rule Formula.

Syntax:

Table 34-11 LGK Function details

Where	LGK	Function Name
	Coeff	User defined Coefficient Code number
	Lag	Relative to Coefficient defined buckets 0 = Current bucket -1 = Previous Bucket 1 = Next bucket etc.

SK (Coeff)

Used in Market Value Formulas

The SK Function allows the use of a user defined coefficient to be used in the formulas. This features provides for ease of use and flexibility in building of Formula Results Rule formulas.

Syntax:

Table 34-12 SK Function details

Where	SK	Function Name
	Coeff	User defined Coefficient Code number

RT (IRC, Lag, Term, Mult)

Used in Cash Flow Formulas only

The RT function returns the value of the Forecasted Interest Rate Code from the Forecast Rate ID utilized in the Processing ID.

Syntax:

Table 34-13 RT Function details

Where	RT	Function Name
	IRC	Interest Rate Code used in Historical and Forecast Rate ID.
	Lag	Relative to Formula Results Rule buckets. May be positive or negative. 0 = Current bucket -1 = Previous bucket 1 = Next bucket etc.
	Term	Point on the yield curve.
	Mult	Numeric code for multipliers 1 = Days 2 = Months 3 = Years

 **Note:**

The Term/Mult combination must be exact, even for interest rate codes with a single point. If the interest rate code has a 1 Y point, you cannot refer to it as the 12 M point. You must use 1 Y. Refer to the chapters Historical Rates ID or Forecast Rates ID elsewhere in this Guide for exact Term/Multiplier definition.

Example: The 1 Year point on the Treasury Yield Curve (110) with no lags = RT(110,0,1,3)

DAYS (Lag)

Used in Cash Flow Formulas Only

The DAYS function returns the number of days in the current modeling bucket or a range of modeling buckets. For example, if you defined 60 monthly modeling buckets in the Config. ID. The DAYS function will return the number of days in its respective bucket, i.e. January; 31 days, February; 28 days. Conversely, if you had defined each modeling bucket to be a period of just 2 weeks, the DAYS function would return 14.

Syntax:

Table 34-14 DAYS function details

Where	DAYS	Function Name
	Lag	Relative to Formula Results Rule buckets. May be positive or negative.
Bucket 1- January 31 days DAYS (0) Result: 31	Bucket 2 - February 28 days DAYS(-1) Result: 59	Bucket 3 - March 31 days DAYS(-2) Result: 90

The Lag feature in the DAYS function works differently than the other functions. Where lag normally identifies from which bucket relative to the current bucket to extract data, in the DAYS function it works as a parameter for accumulation. For example, a lag of -1 will take the number of days in the previous bucket and add it to the number of days in the current bucket, i.e. Results: 59

MONTH()

Used in Cash Flow Formulas Only

The MONTH function returns the numeric value of the month of the 1st day of the current modeling bucket. Example: Current modeling bucket is January; MONTH() will return 1. If the modeling bucket is Jan-1 through Mar-31, MONTH() will also return 1.

Syntax:

Table 34-15 MONTHS function details

Where	MONTH	Function Name
	()	open/close parentheses

34.4.3 Additional Functions

As well as system defined Functions, the Formula Results Rule also utilizes the standard mathematical, logical and relational operands and functions.

Mathematical Functions

Table 34-16 Mathematical Functions

Function	Description
Abs	Returns the positive value of the expression. Example: Abs(-3.5) = 3.5.
Greatest:	Allows you to return the maximum value of the expression. Syntax: Greatest(Expr, Expr).
Least:	Allows you to return the minimum value of the expression. Syntax: Least(Expr, Expr).
Power:	Allows you to raise one value to the power of a second. Syntax: Power(x, y) returns x raised to the power of y.
Round:	Allows you to round a value to a number of decimal places. Syntax: Round(x, n) returns x rounded to n decimal places.
Log:	Allows you to calculate the log of the expression Syntax: Log(x, n) returns the n log of x.
Case:	Allows you to define if conditionals. Syntax: case when 21>12 then 21 else 12 end

Relational Operators**Table 34-17 List of supported Relation Operators**

Operator	Description
=	Equal to
<>	Not Equal to
>	Greater than
<	Less than
>=	Greater than or Equal to
<=	Less than or Equal to

Numeric Operators

Table 34-18 List of supported Numeric Operators

Operator	Description
+	Addition
-	Subtraction
*	Multiplication
/	Division

Logical Operators**Table 34-19 List of supported Logical Operators**

Operand	Description
AND	Both conditions must be true
OR	Either condition can be true

Other Operators**Table 34-20 List of supported Other Operators**

Operand	Description
(Open paren
)	Close paren
,	Comma

Stochastic Rate Indexing

The purpose of the Stochastic Rate Index Rule is to establish a relationship between the risk-free Interest Rate Codes (IRCs) and the other interest rate codes or indices. With this relationship established, you can forecast rates on any instrument tied to an IRC and as the risk-free rates change. The change in the non risk-free interest rates will depend on the established relationship.

The following are the non risk-free interest rate codes:

- Prime
- LIBOR
- Administered rates
- 11th District COFI

The Stochastic Rate Index Rule is used only in stochastic processing. For more information, see the Defining Stochastic Rate Indexes section.

The procedure for working with and managing the Stochastic Rate Index Rule is similar to the other Oracle Asset Liability Management Business Rules. It includes the following steps:

- Search Stochastic Rate Index Rule. For more information, see the [Searching for Rules](#) section.
- [Defining Stochastic Rate Index rules](#)
- View and Edit Stochastic Rate Index Rule. For more information, see the [View and Edit the Rule](#) section.
- Copy Stochastic Rate Index Rule. For more information, see the [Copy the Rule](#) section
- Delete Stochastic Rate Index Rule. For more information, see the [Delete the Rule](#) section

35.1 Defining Stochastic Rate Indexes

A formula must be defined for each interest rate index tied to an instrument. The formula must be in the following form:

Figure 35-1 Stochastic Rate Index Formula

$$\text{Index Rate}_{\text{term},m} = K_1 \cdot \text{Risk-Free-Rate}_1^{x_1} + K_2 \cdot \text{Risk-Free-Rate}_2^{x_2} + \dots + K_8 \cdot \text{Risk-Free-Rate}_8^{x_8} + \text{Spread}$$

To create a formula, select up to eight terms (elements) from the risk-free curve, each multiplied by a user-defined coefficient, and raised to the power of a user-defined exponent. Also, you can add a constant spread to the formula. It is not necessary to define any assumptions for the risk-free curve. Any definition for this curve is ignored and does not affect processing.

Each of the elements consists of:

- **A coefficient:** A multiplier to weigh each term selection.
- **An exponent:** An exponent to allow for polynomial curve-fitting.
- **A term selection:** A selection of rates associated with a term from the risk-free curve.

These elements define a different rate forecast generated for each instrument, with a given IRC. The definition of rate indexes is part of the **Create Stochastic Rate Index Rule** process in which rate indexes are defined for currency-valuation curve combinations. When you click **Save** in the **Create Stochastic Rate IndexRule** process, the rule is saved and the **Stochastic Rate Index Rule** summary page is displayed. However, the rate indexes have not yet been defined for any of the currency-valuation curve combinations. Define the rate indexes for currency-valuation curve combinations before clicking **Save**.

Prerequisites

- Decide on historical rate information and manage by creating Interest Rate Codes.
- Perform the steps to create or edit a Stochastic Rate Index rule.

To create a Stochastic Rate Index rule, follow these steps:

1. Navigate to the **Stochastic Rate Index Valuation Curve Assignment** page.

Figure 35-2 Stochastic Rate Indexing

Stochastic Rate Indexing

Assumption Specification > Stochastic Rate Indexing

Rate Index Details

Name* hdtb

Description

Folder* PFTSEG

Access Type* Read Only Read/Write

Valuation Curves | Index Definition for Currency | Index Term Definition

Select	Currency *	Description
<input checked="" type="checkbox"/>	USD	US Dollar

(USD) 2102332 (7777)
 (USD) CS Libor Curve (5515)
 (USD) QATAR QAR BASE (2101)
 (USD) rurt (4546)
 (USD) sgbnfqv (111)
 (USD) wsd (345)

Edit Definition Cancel

Save As Save Cancel

2. Enter the following information as tabulated.
Rate Index Details Window

Form fields to Define Stochastic Rate Indexes

Term	Description
Valuation Curve	The Valuation curve is used to calculate the future rates of Indexes (IRCs) defined in a Stochastic Rate Index rule. Assign a Valuation curve for each currency during the creating process of the Stochastic Rate Index rule. The Valuation curve and the indexed rate curves are derived from the same Referenced Currency. For example, use the US Treasury Yield Curve as the Valuation curve to calculate the forward rates of any US dollar-based Interest Rate Code.
Coefficient	A multiplier to weigh each term selection.
Exponent	An exponent to allow for polynomial curve-fitting.
Index Term	An Interest Rate Code is made up of one or many term points that denote a particular interest rate yield curve structure. OFS ALM generates future rates for term points in the Interest Rate Code based on an arithmetic formula that has the following components: A combination of term point rates from the valuation curve (with a maximum selection of eight terms or elements), which need not be the standard term points as defined in the IRC definition of the valuation curve. A coefficient and an exponent for each of the valuation curve term points. A single spread per index term point. A formula must be defined for each index tied to an instrument.

Figure 35-3 Stochastic Rate Indexing Formula

$$\text{Index Rate}_t = \sum_{n=1}^8 [\text{Coefficient}_n \times (\text{RFR}_T)^{\text{Exponent}_n}] + \text{Spread}_n$$

Where:

t: is the term point of the index.

T: is the term point of the valuation curve.

n: is the number of term points of the valuation curve referenced.

RFR: is the rate of the specific term point on the valuation curve.

To create a formula, select up to eight-term points (elements) from the risk-free curve. Each must be multiplied by a user-defined coefficient and raised to the power of a user-defined exponent. Also, add a constant spread for each of the term points used in the formula.

3. Select Currency.

4. Navigate to the **Valuation Curve** tab and select a **Valuation Curve** for the selected currency .

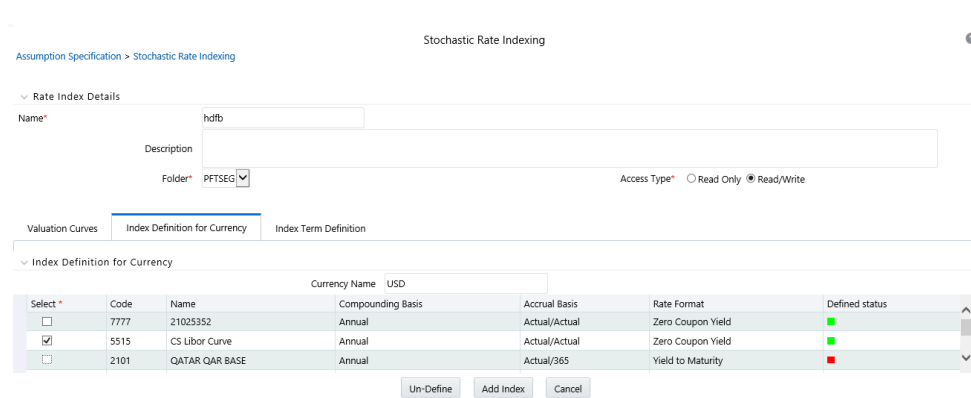
 **Note:**

Only a single Valuation Curve can be associated with a particular currency. For example, if the Valuation Curve for US Dollars is US Treasury Curve, all US Dollar indexes will be associated with the US Treasury curve.

Select a risk-free interest rate structure. Not all the Interest Rate Codes in the application will have the characteristics of a risk-free rate curve, but the application will not prevent you from selecting any curve as the Valuation Curve.

5. Select **Apply**.
6. Navigate to the **Index Definition for Currency** tab and select the Index using **Add Index**.

Figure 35-4 Stochastic Rate Indexing



Assumption Specification > Stochastic Rate Indexing

Stochastic Rate Indexing

Rate Index Details

Name* hdtfb

Description

Folder* PFTSEG

Access Type* Read Only Read/Write

Valuation Curves | **Index Definition for Currency** | Index Term Definition

Index Definition for Currency

Currency Name USD

Select *	Code	Name	Compounding Basis	Accrual Basis	Rate Format	Defined status
<input type="checkbox"/>	7777	21025352	Annual	Actual/Actual	Zero Coupon Yield	■
<input checked="" type="checkbox"/>	5515	CS Liber Curve	Annual	Actual/Actual	Zero Coupon Yield	■
<input type="checkbox"/>	2101	QATAR QAR BASE	Annual	Actual/365	Yield to Maturity	■

Un-Define Add Index Cancel

7. Navigate to the **Index Term Definition** tab. The attributes of both the valuation curve and the selected IRC, are listed in Table 1. This information can be used as a reference to define the terms.
8. **Add Index Term Definitions.** The **Add Index Term Definition** Page is displayed. The general attributes of both the Valuation Curve and the selected IRC, are displayed. This information can be used as a reference when you define the terms. Each Index Term Point can be calculated from up to eight elements of the valuation curve. The valuation curve elements specified can be any term point on the yield curve, it is not restricted to the points displayed for the valuation curve.

Figure 35-5 Stochastic Rate Indexing

9. Select the **Index Term**.
Not all IRCs have Term Points defined. To successfully define an Index, you must define at least one of its terms. Else define one, many, or all of the Index Terms. The selection of the Index Term is limited to the standard Term Points as defined in the IRC definition.
10. Enter a **Spread** for the **Index Terms**, if required. A Spread is a constant percentage added to the rate produced as a result of the Monte Carlo calculations, multiplied with the defined coefficient, and raised to the power of the mentioned exponent.
11. Enter the **Valuation Curve Term Point** and select the **Multiplier**.
12. Enter a **coefficient** for the element.
13. Enter an **exponent** for the element.
14. Repeat the last four steps for a maximum of seven more elements for each term.
15. Click **Apply** when indexing is completed for all the required term points.
The **Stochastic Rate Index Valuation Curve** page is displayed. You can navigate to the **Index Definition** tab and continue defining rate index relationships for the existing currency selection or switch currencies, define the valuation curve for the new currency and proceed with Rate Index definitions.

 **Note:**

During rule creation, on the **Index Definition for Currency** tab, the undefined IRCs are displayed in the top half of the window and the defined IRCs are displayed in the bottom half of the window. After saving the rule and re-entering in Edit mode, you can see the status reflected for all defined (green) and undefined (red) IRCs in the top half of the window. To Edit any Rate Index relationships, select the appropriate IRC, and again select **Add Index** and proceed with any changes.

16. Click **Save**.
17. The **Stochastic Rate Index Rule Summary** page is displayed.

ALM Processing

When all the required assumptions are defined, ALM Processing performs calculation processes and generates a result set. There are four types of ALM processing rules, each to be described in detail later in this module.

- Static Deterministic
- Static Stochastic
- Dynamic Deterministic
- Dynamic Stochastic

Depending on what type of process you choose, the corresponding Process Rule guides you through the required inputs on the process flow screen.

This chapter covers the following topics:

- [Creating an ALM Process Rule](#)
- [Executing an ALM Process](#)

ALM Processes allow you to perform the following tasks:

- Determine the data that you want to process (Product Hierarchy block).
- Submit to the ALM processing engine the financial element results you want to calculate: (Calculation Elements).
- Specify to the ALM processing engine the product characteristics, prepayments, discount methods and forecast assumptions to be used in the process (Rule Selection blocks).
- Specify the Forecast Rate Scenarios (for Deterministic processes) or Rate Index (for Stochastic processes) you want to include.
- Specify a process with only runoff (Static), or with new business included (Dynamic).
- Define the output dimension and what additional attributes you want updated at the instrument level (Output Preferences block).
- 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 entire new process (Processing Parameters block).
- Formulate and execute the ALM processing request and generate results (ALM Process SummaryPage).

Following buttons are available on Process Summary grid:

Add

Clicking on the Add control allows you to create a new ALM Process rule. The Add control is disabled if any rows in the grid have been selected.

View

Selecting a single row out of the grid enables the View control. Clicking on 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

Selecting a single row out of the grid enables the Edit control. Clicking on the Edit control allows you to modify a previously saved Process rule. The Edit control is only enabled when a single Process rule has been selected.

Copy

Selecting a single row out of the grid enables the Copy control. Clicking on the Copy control allows you to create a copy of an Process rule. The Copy control is only enabled when a single Process has been selected.

Check Dependencies

To generate a report on the OFSAA rules that utilize a selected process, select a single process and click on the Check Dependencies control. The Check Dependencies control is only enabled when a single process has been selected.

Delete

Selecting one or more rows out of the grid enables the Delete control. Clicking on the Delete control deletes the process rule(s) you have selected.

Execute

Clicking on Execute button allows you to execute an existing process. After execution, the status of process will either change to Success or Fail.

Refresh

Clicking on refresh button refreshes the Process Rule summary page. BI Transformation

Transformation ALM results button allows you to push the ALM Results from the ALM Processing area to the ALM BI Mart. It moves the ALM result data from ALM Processing Tables to ALM BI FACT Tables for Reporting. It transforms both Deterministic and Stochastic ALM results as well as other related information such as forecast rates and detailed cash flows, based on the type of process and processing options selected. Note, this option will be enabled only if user is mapped to ALM BI application.

36.1 Creating an ALM Process Rule

To define an ALM Process Rule, complete the following steps:

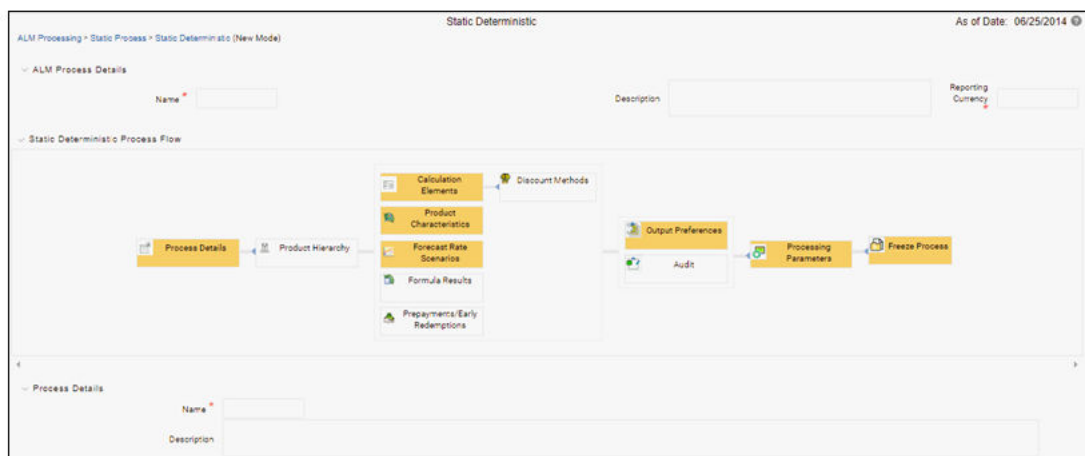
1. Determine the required process type: Static or Dynamic, Deterministic or Stochastic and choose the desired process from the menu bar.
2. From the Summary Page, click **Add**.
3. The process will take you through a series of required steps to define the flow depending upon what type of process you selected. For each of the blue highlighted boxes in the process flow area, you are required to make a selection. The gray boxes are optional but will have an effect on the result set if defined.
 - [Creating a Static Deterministic ALM Process Rule](#)

- [Creating a Static Stochastic / Historical Simulation Process Rule](#)
- [Creating a Dynamic Deterministic Process Rule](#)
- [Creating a Dynamic Stochastic / Historical Simulation Process Rule](#)

36.1.1 Creating a Static Deterministic ALM Process Rule

Deterministic processing generates output based on a set of user-defined forecast rate scenarios. The static process indicates that new business assumptions are not included in this flow.

Figure 36-1 Static Deterministic ALM Process



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.
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
 - b. Alternatively, select the Source Selection button, and select the instrument tables corresponding to the data you want to include in the process.
 - c. 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 or Source Selection. 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 default chart of account member of -1.
 - 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.

- d. Select Apply.

Related Topics: For more information on Product to Instrument mapping procedure, see [Oracle Financial Services Analytical Applications Infrastructure User Guide](#).

3. Rule Selection Blocks – 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 ALM 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 detail 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 aggregated results to the Result or Consolidated Master or Result or Consolidated Detail output tables.
 - b. Choose the calculation elements to include in the process run: "Market Value, YTM, Duration, DV01/PV01", "Repricing Gap", "Liquidity Gap", "Average Life", "Transfer Pricing" – if defined then select the Folder and Transfer Pricing Rule, TP Adjustments – if defined* then select the Folder and TP Adjustment Rule, Effective Interest Rate, Repricing Balances and Rates, Runoff components, Prepayment Runoff – if defined, Tease, Cap, Floor and Negative Amortization Details, Standard Financial Elements.
 - c. Include Non Rate Sensitive Bucket check-box gets enabled when 'Repricing Gap' is selected. A new Attribute of product dimension 'Interest Rate Sensitivity Category' is introduced to identify products as Interest Rate sensitive or Non Interest Rate sensitive. Once 'Include Non Rate Sensitive Bucket' is enabled, reprice gap output of Products which are mapped as Non Interest Rate sensitive, would move into Non Interest Rate Sensitive bucket.

For more information on Non Interest Rate Sensitive Bucket, see Time Buckets
If 'Include Non Rate Sensitive Bucket' is not enabled, engine will ignore 'Interest Rate Sensitivity Category' product attribute, and would treat all products as Interest Rate Sensitive. Reprice Gap output would move into respective Reprice Gap buckets.

If 'Treat Margin as Fixed Rate After First Reprice' is enabled, engine will calculate the margin of adjustable rate instruments to continue generating interest cash flows after a gap repricing event up until contractual maturity or other total runoff.

- d. Select the Market Value, YTM, Duration, DV01/PV01 option if you want to measure the price sensitivity for small changes in the underlying interest rate curves (DV01/PV01). For this calculation, Market Value is also required.
- e. Choose Embedded Option Decisioning. This is an optional selection. This is a drop-down list with the following values:
Cashflow to Maturity– This selection ignores the option on the instrument and treats it as a regular bond. This is the default behavior.

Cashflow to the first Expiry Date– This selection forces the option on the instrument to be exercised on the first applicable date. American options exercise the option on start date if option start date > as of date. Else, if as_of_date > option start date, the option is called in the 1st time bucket.

Rate Path Dependent – This selection, checks the exercisability of the option on the bond, as per the scenario defined.

- f. The Calculate Option Market Value option is used to calculate the Market Valuation (MV) for certain embedded and stand-alone (bare) options. Supported embedded options are Calls, Puts, Caps (caplets) and Floors (floorlets). This option will be enabled only if Market Value, YTM, Duration, DV01/PV01 option is also selected. For example,

When Calculate Option Market Value check-box is selected and RATE_CAP_LIFE has data filled (that is, holds a non-null value greater than 0), then Embedded CAP Option MV will be calculated.

When Calculate Option Market Value check box is selected and RATE_FLOOR_LIFE has data filled (that is, it is non-null value greater than 0 or it is less than RATE_CAP_LIFE and RATE_CAP_LIFE is greater than 0), then Embedded FLOOR Option MV will be calculated.

- g. Click Apply.
- h. If Market Value is chosen from step 1 above, the Discount Methods box will become highlighted blue and need to be defined (see Discount Methods, for rule set up). If no market value chosen, continue to step 5 below.
- i. Select from the discount methods box the desired method (see Discount Methods, for set up) and click Apply.
- j. From the Product Characteristics bar, select the desired definition and click **Apply** (see Product Characteristics, for rule definition).
- k. Select the Forecast Rates rule you want applied to the process, and click **Apply**. (see Forecast Rate Scenarios , to set up rate scenarios). The flow will now take you to output preferences. Or, if you want to add a prepayment rule to the process, continue to step 7 below.
- l. Click the Prepayments/Early Redemptions box and choose the defined prepayment rule (see Prepayment Rules). This is an optional step.

4. Output Preferences options

- a. Select the output dimension from the drop-down list (Options include: Product, Product/Currency, Organization/Product, Organization/Product/Currency).
- b. Depending on the dimension chosen, you can Consolidate to Reporting Currency by checking the box if the dimension Product /Currency or Organization/Product/Currency was chosen.
- c. If you have the ALMBI reporting product, you can select to export the results to the ALM BI Mart by clicking the box. You also have the option to update the Instrument Data Tables with financial measures by checking the box of the desired calculated item (Market Value, Macaulay Duration, Modified Duration, Convexity, Yield to Maturity, Average Life, DV01/PV01, Option Market Value, Structured Cashflow Attributes*). The DV01/PV01 and Option Market Value options will be enabled only if Market Value, YTM, Duration, DV01/PV01 option is selected in Calculation block. Select **Apply Limit to BI** option, if you want to use the defined repricing gap limit with ALM BI report. This is useful, if you want to view repricing gap report with a limit set as per your risk policy. **Apply Limit to BI** option will be enabled only if **Move Results to ALMBI Mart** option is active.
- d. Click **Apply** after the page is defined. The process will take you to the Processing Parameters section. Or you can click the audit box for the following options: If no audit options are required, skip to #6, Processing Parameters.

* The Structured Cashflow Attributes option will be enabled only if you are mapped to Moody's structured cashflow functionality.

5. Audit Preferences (optional)
Known Issue

If you select FE in ALM process and data contains rate-tier instrument, then ALM process will fail.

- **Detailed Cash Flow:**

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:

Input the desired number of Records in the dialog box

Select all records to be output.

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 selection over to the selected section.

Click apply, or go to step 2 for Forecast rates output.

- **Tiered Balanced Cash Flows**

Tiered Balanced Cash Flows option allows you to define the Tiered balance interest. The Tiered balance interest is useful when a different interest rate is paid/charged for parts of an account balance that fall within set amount ranges. Payment frequency, current payment and so on can will be defined at account level. Reprice frequency, next reprice date and so on can be defined at tier level.

Select this option when you want system to write detailed cash flows are rate tier level.

- **§ 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.

For consolidation of Formula Results output, ensure to select respective currencies in Audit section.

Click Apply and the screen will take you to Processing Parameters.

6. Processing Parameters:

9.

a. The processing parameters allow you to run an entire process or re-process a portion of an existing run. 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 Auto balancing accounts: If you selected Auto Balancing in the Output Preferences (section 4.4.) the Auto Balancing Accounts option is available for re-processing. Click the box to apply.

d. Select the desired product Hierarchy Filter from the drop-down list to indicate which products should be re-processed.

e. Click Apply and the screen will take you to Freeze Process section.

10. 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.

11. Stop Holiday Calendar checkbox is provided with a calendar date picker. If checked, a calendar is enabled on which a date can be selected. Cash flows generated post this date will not apply the holiday calendar. On selecting the checkbox a warning message will pop up stating If Enabled, the outputs could have a combination of adjusted and unadjusted cashflows.

NOTE:

Holiday calendar is used to adjust the outputs on holiday events, which may increase processing time. If Users do not want to have adjusted output after a certain time point, say, when buckets become wider, then this field stops adjusting cashflows from that time point, reducing processing time. If user wants to have cash flow adjusted for entire processing period, then this field does not require any input.

36.1.2 Creating a Static Stochastic / Historical Simulation Process Rule

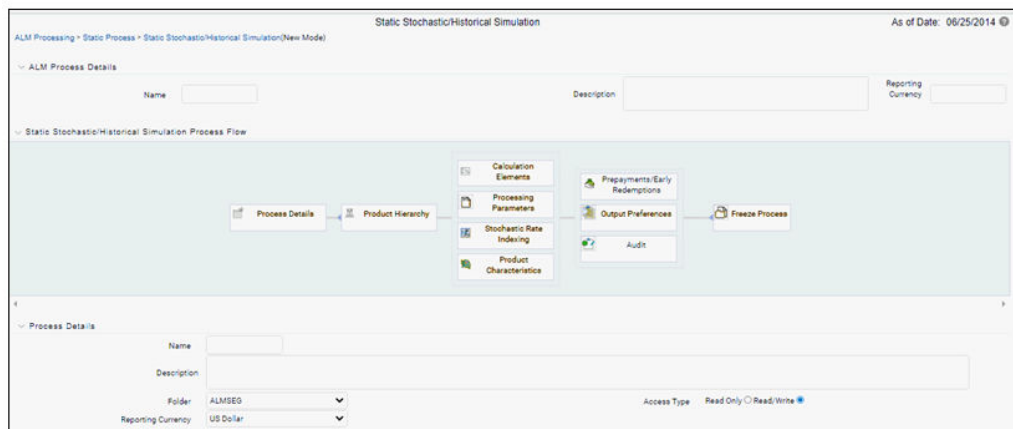
Stochastic Processing differs from Deterministic Processing in that it generates Market Value and Value at Risk through Historical or Monte Carlo simulations. Rate scenarios are generated based on Random 1 month rates and a Term Structure model, which describe how the interest rate curve changes over time. Before instrument records are processed, balance and payment fields are first translated to the reporting currency, and then reported in the reporting currency.

Note:

Stochastic simulation is a single factor modeling of interest rates of Reporting Currency. Although the engine does convert Balances into Reporting Currency, there is no correlation of Risk factors of particular Currency's Interest rates with Reporting Currency. Stochastic processing is not intended for Multi-currency processes.

For best results, run Stochastic calculation for a Single currency where Functional Currency = Reporting Currency.

Figure 36-2 Static Stochastic / Historical Simulation Process



1. Follow steps 1 and 2 from the Static Deterministic process defined above.
2. Calculation Elements
 - a. Select the calculation elements. There are two choices: VaR and Market Value Value at Risk: Value at Risk measures the probability of changes in value of the current position data, occurring over specified time horizons, displayed in the interface as the At Risk period. The At-Risk period defines the time period over which changes in market value are calculated.

When the user selects the Value at Risk calculation option and subsequently runs the process, the software will in addition to calculating the current market value, calculate the change in market value for each rate path and rank these

changes in market value for each product leaf and for the entire balance sheet. These results are stored in two tables: FSI_O_STOCH_VAR and FSI_O_STOCH_TOT_VAR.

 **Note:**

When Value at Risk is selected, market value is also written to the FSI_O_STOCH_MKT_VAL table.

Market Value: Market Value is calculated per rate scenario for each Product Leaf member. The result Market Value is the total Market Value over the number of rate paths per Product Leaf. The results are stored in FSI_O_STOCH_MKT_VAL.

- b. Stop Holiday Calendar checkbox is provided with a calendar date picker. If checked, a calendar is enabled on which a date can be selected. Cash flows generated post this date will not apply the holiday calendar. On selecting the checkbox a warning message will pop up stating If Enabled, the outputs could have a combination of adjusted and unadjusted cashflows.

 **Note:**

Holiday calendar is used to adjust the outputs on holiday events, which may increase processing time. If Users do not want to have adjusted output after a certain time point, say, when buckets become wider, then this field stops adjusting cashflows from that time point, reducing processing time. If user wants to have cash flow adjusted for entire processing period, then this field does not require any input.

- c. Click Apply and the screen will take you to Processing Parameters.
3. Processing Parameters: Here you set the parameters for the stochastic process by selecting the term structure model, smoothing method, number of rate paths, Random number generation method, and seed value. Each is described in the following sections There is a toggle that enables the user to choose between Monte Carlo Simulation and Historical Simulation, with the default selection being Monte Carlo Simulation.

If Historical Simulation is selected, only Smoothing Method and Number of Rate Paths is enabled for selection. If Monte Carlo Simulation is selected, then all the five parameters are enabled for selection.

- a. Term Structure Method: four models to choose from: For more information on term structure models, see the Oracle Financial Services Analytical Applications Cash Flow Engine Reference Guide.
 - Merton—real interest rate model
 - Ho and Lee—no arbitrage model
 - Vasicek—real interest rate model
 - Extended Vasicek— no arbitrage model
- b. Smoothing method: Smoothing is the drawing of a smooth, continuous line through observable market data points. Because there are an infinite number of these lines passing through a given set of points, additional criteria must be added to the

smoothing process to achieve the desired term structure. The following 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

$$y = a + bx + cx^2 + dx^3$$

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

$$Y = a + b X^1 + c X^2 + d X^3 + e X^4$$

The end knot points satisfy equations for one curve and all intermediate points satisfy two curves. Hence in a scenario with 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 $5*(n-1) \times 5*(n-1)$. The matrix is formed according to the following logic:

The second derivative at the end points and the first derivative of the last point is Zero.

At the points other than the end points the value of the first derivatives, second derivatives and the third derivatives of the function are equal.

- c. **Number of paths** – Specifies the number of simulations to execute. The valid range is from 1 to 2100. If the number of rate paths is not within the range of 1 to 2100, then an error message is displayed to the user. However, this value is subject to the Maximum number of Rate Paths for Monte Carlo Processing entered in the Application Preference. You can enter a value that is less than or equal to value that entered in the Maximum number of Rate Paths for Monte Carlo Processing field in the Application Preference.
- d. **Random Number Generation Method:** To run Monte Carlo simulations, you must specify the random number generator algorithm for the rate path generation.
 - Low Discrepancy Sequences:** Also known as quasi-random sequences, are designed to prevent clustering of generated numbers; this results in achieving better accuracy than pseudo-random sequences when applied to numerical problems; integration in high dimensions, and so on
- e. **Pseudo Random Sequences:** The traditional random numbers generated by most compilers. They are designed to do well on some statistical tests: low autocorrelation, high period before the sequence repeats itself.

- f. Seed Value: Fixed or Variable. If fixed, maximum value of 999. Fixed seed selection results in the same set of random numbers being generated with each run. If you keep the fixed seed a constant value, you will be able to re-produce results from one run to another. The variable seed option allows the system to determine the seed value randomly with each run. This option will result in a different set of random numbers for each run and hence different results from each run. Note: Seed value selections apply to the Pseudo Random Sequences option only.

Once defined, click Apply and you will be taken to the Rate Index window.

4. Rate Index: Select the rate index as it was defined in the Stochastic Rate Indexing rule, (For additional information on the setup rules for rate indexing, see Stochastic Rate Indexing)
Click Apply. The screen will take you to Product Characteristics.

Product Characteristics: Select the desired product characteristics rule. (For more information on creating a product characteristic rule, see Product Characteristics)

Click Apply and the screen will take you to Output Preferences.

If you want to include a prepayment or early redemption rule in the process run, Click the Prepayments/Early Redemptions box and choose the defined prepayment rule (see Prepayment Rules). This is an optional step.

5. Output Preferences options
 - a. Select the Output Dimension from the drop-down list.

 **Note:**

Only Product output dimension is supported for Stochastic/Historical Simulation processing.

- b. If you have the ALMBI reporting product, you can select to export the results to the ALM BI Mart by clicking the box.
 - c. Click **Apply**. The screen will take you to the Freeze Process Or you can click the audit box for the following options: If no audit rule is selected, skip to #8, Freeze Process
6. Audit Preferences (optional)

 **Note:**

Known Issue

If you select FE in ALM process and data contains rate-tier instrument, then ALM process will fail.

- a. Detailed Cash Flow: 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 option below:
Input the desired number of Records in the dialog box

- b. When Monte Carlo Simulation is selected in the Processing Parameters, the One Month Rates is enabled for definition. One Month Rates defines rates to be written during the Monte Carlo simulation for auditing purposes. Select this option to view the rate paths generated during the stochastic processing run. When selected, 360 monthly rates are output to the FSI_INTEREST_RATES_AUDIT table, for each rate path. Note: This process can be extremely time consuming and database space intensive when processing large numbers of rate paths
- c. When Historical Simulation is selected in the Processing Parameters, the All Term Point Rates for 5 Rate Paths is enabled for definition. All Term Point Rates for 5 Rate Paths defines rates to be written during the Historical Simulation for auditing purposes. Once clicked, a warning message is displayed as follows: "Selecting All Term Point Rates will result in large amount of data being written to the Forecast Rates Audit table. Are you sure you want to proceed?"
- d. Tiered Balanced Cash Flows: Tiered Balanced Cash Flows option allows you to define the Tiered balance interest. The Tiered balance interest is useful when a different interest rate is paid/charged for parts of an account balance that fall within set amount ranges. Payment frequency, current payment and so on can will be defined at account level. Reprice frequency, next reprice date and so on can be defined at tier level.

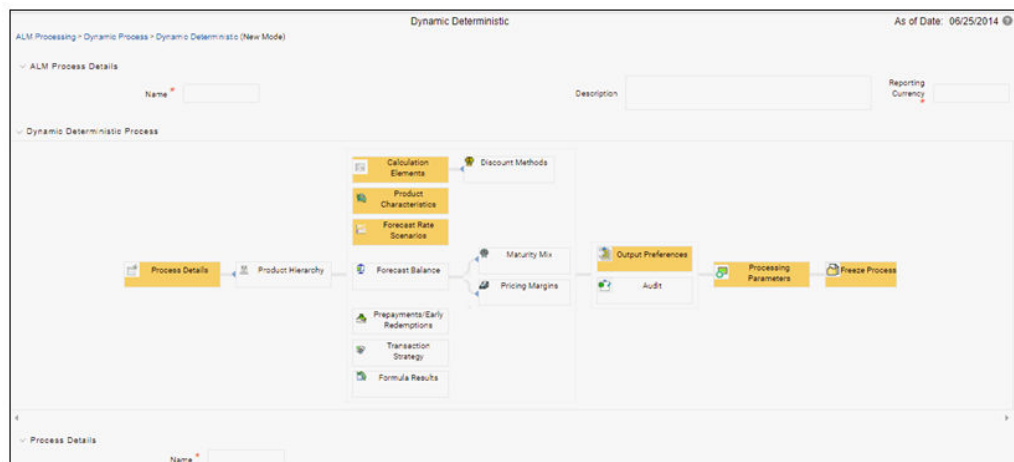
Select this option when you want system to write detailed cash flows are rate tier level.

7. 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.

36.1.3 Creating a Dynamic Deterministic Process Rule

Figure 36-3 Dynamic Deterministic Process



Dynamic Deterministic processing generates output based on a set of user-defined forecast rate scenarios and includes new business assumption rules in the process flow.

1. Follow steps 1 and 2 from the Static Deterministic process defined above.

 **Note:**

If a Hierarchy Filter or Attribute Filter is attached to a Dynamic Deterministic process, ensure that Filter is created on Product Dimension.

If attached Hierarchy Filter or Attribute Filter is created on any dimension, other than Product dimension (for example say it is created on Organization Unit dimension), new business output from Dynamic deterministic process is not populated. For these use case, to ensure new business output is populated, User can create Data Element Filter instead of Hierarchy Filter or Attribute Filter.

2. Rule Selection Blocks

- a. Choose the calculation elements to include in the process run: "Market Value, YTM, Duration, DV01/PV01", "Repricing Gap", "Liquidity Gap", "Average Life", "Transfer Pricing" – if defined then select the Folder and Transfer Pricing Rule, TP Adjustments – if defined then select the Folder and TP Adjustment Rule, Effective Interest Rate, Repricing Balances and Rates, Runoff components, Prepayment Runoff – if defined, Tease, Cap, Floor and Negative Amortization Details, Standard Financial Elements. Market Value can be calculated for the as-of-date and other dates in the future. These forward dates are defined in the Time Bucket Rule, and are shared with repricing and liquidity gap calculations. For more information on setting up dynamic start dates, see Time Buckets

Select the Market Value, YTM, Duration, DV01/PV01 option if you want to measure the price sensitivity for small changes in the underlying interest rate curves (DV01/PV01). For this calculation, Market Value is also required.

Gaps: Select Liquidity or Repricing Gap to generate dynamic gap results. To use this option, you must first define the related GAP buckets in your active Time Bucket rule. Gap profiles contain bucket-based runoff and reprice information. The information represents the balance sheet as of the dynamic gap date. A special set of financial elements is produced for both repricing gap and liquidity gap results.

 **Note:**

Include Non Rate Sensitive Bucket check-box gets enabled when 'Repricing Gap' is selected. A new Attribute of product dimension 'Interest Rate Sensitivity Category' is introduced to identify products as Interest Rate sensitive or Non Interest Rate sensitive. Once 'Include Non Rate Sensitive Bucket' is enabled, reprice gap output of Products which are mapped as Non Interest Rate sensitive, would move into Non Interest Rate Sensitive bucket. For more information on Non Interest Rate Sensitive Bucket, see Time Buckets chapter.

If 'Include Non Rate Sensitive Bucket' is not enabled, engine will ignore 'Interest Rate Sensitivity Category' product attribute, and would treat all products as Interest Rate Sensitive. Reprice Gap output would move into respective Reprice Gap buckets.

Transfer Pricing: During processing, the model tracks transfer rates and transfer pricing charges/credits on individual transactions. This information is aggregated, per leaf member, as financial elements and written to the results tables. Examples of transfer pricing financial elements include:

Beginning transfer rate

Ending transfer rate

Average transfer rates

Transfer pricing charge/credit

- b. Stop Holiday Calendar checkbox is provided with a calendar date picker. If checked, a calendar is enabled on which a date can be selected. Cash flows generated post this date will not apply the holiday calendar. On selecting the checkbox a warning message will pop up stating "If Enabled, the outputs could have a combination of adjusted and unadjusted cashflows".

 **Note:**

Holiday calendar is used to adjust the outputs on holiday events, which may increase processing time. If Users do not want to have adjusted output after a certain time point, say, when buckets become wider, then this field stops adjusting cashflows from that time point, reducing processing time. If user wants to have cash flow adjusted for entire processing period, then this field does not require any input

- c. The Calculate Option Market Value option is used to calculate the Market Valuation (MV) for certain embedded and stand-alone (bare) options. Supported embedded options are Calls, Puts, Caps (caplets) and Floors (floorlets). This option will be enabled only if Market Value, YTM, Duration, DV01/PV01 option is also selected.

For example,

When Calculate Option Market Value check-box is selected and RATE_CAP_LIFE has data filled (that is, holds a non-null value greater than 0), then Embedded CAP Option MV will be calculated.

When Calculate Option Market Value check box is selected and RATE_FLOOR_LIFE has data filled (that is, it is non-null value greater than 0 or it is less than RATE_CAP_LIFE and RATE_CAP_LIFE is greater than 0), then Embedded FLOOR Option MV will be calculated.

- d. Click **Apply**.
- e. If Market Value is chosen from step 1 above, the Discount Methods box will become highlighted blue and need to be defined (see Discount Methods, for rule set up). If no market value chosen, continue to step 5 below.
- f. Select from the discount methods box the desired method (see Discount Methods, for set up) and click Apply. The screen will take you to Product characteristics rules box.
- g. From the Product Characteristics bar, select the desired definition and click Apply (see Product Characteristics, for rule definition). The screen will take you to the Forecast Rates rules box.
- h. Select the Forecast Rates rule you want applied to the process, and click Apply. (see Forecast Rate Scenarios, to set up rate scenarios). The flow will now take you to output preferences. Or, if you want to add a Forecast Balance, Prepayment, or Transaction strategy rule to the process, continue to step 7 below.
- i. Forecast Balances: Click the Forecast Balance box and select from the defined forecast balance rules (For more information on setting up rules see Forecast Balance Rules). Click Apply.
The Maturity Mix and Pricing Margin rules will then become necessary to complete the forecast assumption selection process.

Maturity Mix: Select the desired Maturity Mix rule and click Apply. For more information on how to set up the Maturity Mix.

Pricing Margins: Select the desired Pricing Margin rule from the defined list and click Apply. The screen will take you to output preferences, or continue to step 8 below to include prepayment, or transaction rules.
- j. Click the Prepayments/Early Redemptions box and choose the defined prepayment rule and click "Apply" (see Prepayment Rules . This is an optional step.
- k. Click the Transaction strategy box and select the defined transaction strategies for inclusion in the process. Click **Apply** (Transaction Strategies for information on defining rules).

3. Output Preferences options

- a. Select the output dimension from the drop-down list (Options include: Product, Product/Currency, Organization/Product, Organization/Product/Currency).
- b. Depending on the dimension chosen, you can Consolidate to Reporting Currency by checking the box if the dimension Product /Currency or Organization/Product/ Currency was chosen.
- c. If you have the ALMBI reporting product, you can select to export the results to the ALM BI Mart by clicking the box.
- d. If Product was chosen from the Dimension in step 1 above, you can select the Autobalancing feature by clicking on the box.
Use autobalancing to maintain a balanced balance sheet, and generate retained earnings, dividends and taxes. Product leaf members used during the autobalancing process must be defined within your Application Preferences, including:

Assets

Liabilities

Retained Earnings

Dividends

Federal Tax

State Tax

Accumulated Translation Balance

If you do not completely define the required autobalancing leaves in Application Preferences, an error message is generated during processing. For more information, see Application Preferences.

- e. Click Apply after the page is defined. The process will take you to the Processing Parameters section. Or you can click the audit box for the following options: If no audit rule is selected, skip to #4, Processing Parameters.

 **Note:**

* The Structured Cashflow Attributes option will be enabled only if you are mapped to Moody's structured cashflow library.

- f. Click Apply after the page is defined. The process will take you to the Processing Parameters section.
Or

You can click the Audit box for the following options: If no audit rule is selected, skip to #4, Processing Parameters.

4. Audit Preferences (optional):

 **Note:**

Known Issue

If you select FE in ALM process and data contains rate-tier instrument, then ALM process will fail.

- Detailed Cash Flow:
For Dynamic process, both static and dynamic new business record are populated in `FSI_O_PROCESS_CASH_FLOWS` table.

Check the box to record the cash flows and repricing events occurring for the desired number of records from static instrument record and dynamic new business. If user want get output for a particular set of static record, set the record number high considering new business records created and output.

The number of new business records created depends on new business definition, and can range from few to many for a single product currency combination. For example, forecast balance method of Rollover with multiple Maturity Mix Terms, defined for many modeling time bucket, can create many number of new business records, whereas for forecast balance method of New Add with single Maturity Mix Term, defined for few modeling time bucket, will create few business records.

 **Note:**

The functionality of audit of cash flows in Dynamic process is to validate and proof out small sets of record, and not intended to output entire set of record like static process.

The Financial Elements tab given in the Static Deterministic Process is not applicable to Dynamic Deterministic Process.

- Tiered Balanced Cash Flows
Tiered Balanced Cash Flows option allows you to define the Tiered balance interest. The Tiered balance interest is useful when a different interest rate is paid/charged for parts of an account balance that fall within set amount ranges. Payment frequency, current payment and so on can will be defined at account level. Reprice frequency, next reprice date and so on can be defined at tier level.

Select this option when you want system to write detailed cash flows are rate tier level.
 - Forecast Rates:
Refer to step #5 Forecast Rates in Creating a Static Deterministic Process Rule.
5. Processing Parameters:
 - a. The processing parameters allow you to run an entire process or re-process a portion of an existing run. 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 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. New Business/Transaction Strategies: Select to reprocess the new business and/or transaction strategies defined in the process flow.
 - d. Auto balancing accounts: If you selected Auto Balancing in the Output Preferences (section 3.4.) the Auto Balancing Accounts option is available for re-processing. Click the box to apply.
 - e. Click Apply and the screen will take you to Freeze Process section.
 6. 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.

36.1.4 Creating a Dynamic Stochastic / Historical Simulation Process Rule

Stochastic Processing differs from Deterministic Processing in that it generates Earnings, Market Value and Value at Risk by Historical or Monte Carlo simulations. Rates scenarios are generated based on a Term Structure model, which describes how the interest rate curve changes over time. Before instrument records are processed, balance and payment fields are first translated to the reporting currency, and then reported in the reporting currency.

 **Note:**

Stochastic simulation is a single factor modeling of interest rates of Reporting Currency. Although the engine does convert Balances into Reporting Currency, there is no correlation of Risk factors of particular Currency's Interest rates with Reporting Currency. Stochastic processing is not intended for Multi-currency processes.

For best results, run Stochastic calculation for a Single currency where Functional Currency = Reporting Currency.

1. Follow steps 1 and 2 from the Static Deterministic process defined above.
2. Calculation Elements
 - Select the calculation elements. There are three choices: EaR, VaR and Market Value
 - Earnings at Risk: Earnings at Risk uses the Historical or Monte Carlo rate generator to generate a series of rate paths which is applied to instrument records to produce earning forecasts. This option writes out two standard result sets: average leaf earnings and average total portfolio earnings. Average leaf earnings is written out to EAR_LEAF_AVG_XXX whereas average total portfolio earnings is written out to EAR_TOTAL_AVG_XXX with XXX denoting the system id number of the process.
 - Value at Risk: Value at Risk measures the probability of changes in value of the current position data, occurring over specified time horizons, displayed in the interface as the At Risk period. The At-Risk period defines the time period over which changes in market value are calculated.
 - When the user selects the Value at Risk calculation option in a process ID and subsequently runs that ID, the software will in addition to calculating the current market value, calculate the change in market value for each rate path and rank these changes in market value for each product leaf and for the entire balance sheet. These results are stored in two tables: FSI_O_STOCH_VAR and FSI_O_STOCH_TOT_VAR. Note: When Value at Risk is selected, market value is also written to the FSI_O_STOCH_MKT_VAL table.
 - Market Value: Market Value is calculated per rate scenario for each Product Leaf member. The result Market Value is the total Market Value over the number of rate paths per Product Leaf. The results are stored in FSI_O_STOCH_MKT_VAL.
 - "Stop holiday calendar" checkbox is provided with a calendar date picker. If checked, a calendar is enabled on which a date can be selected. Cash flows generated post this date will not apply the holiday calendar. On selecting the checkbox a warning message will pop up stating "If Enabled, the outputs could have a combination of adjusted and unadjusted cashflows".

 **Note:**

Holiday calendar is used to adjust the outputs on holiday events, which may increase processing time. If Users do not want to have adjusted output after a certain time point, say, when buckets become wider, then this field stops adjusting cashflows from that time point, reducing processing time. If user wants to have cash flow adjusted for entire processing period, then this field does not require any input.

- Click Apply and the screen will take you to Processing Parameters.
3. Processing Parameters: Here you set the parameters for the stochastic process by selecting the term structure model, smoothing method, number of rate paths, Random number generation method, and seed value. Each is described in the following sections: There is a toggle that enables the user to choose between Monte Carlo Simulation and Historical Simulation, with the default selection being Monte Carlo Simulation.

If Historical Simulation is selected, only Smoothing Method and Number of Rate Paths is enabled for selection. If Monte Carlo Simulation is selected, then all the five parameters are enabled for selection.

- a. Term Structure Method: four models to choose from: For more information on term structure models, see the Oracle Financial Services Analytical Applications Cash Flow Engine Reference Guide.
- Merton—real interest rate model
 - Ho and Lee—no arbitrage model
 - Vasicek—real interest rate model
 - Extended Vasicek— no arbitrage model
- b. Smoothing method: Smoothing is the drawing of a smooth, continuous line through observable market data points. Because there are an infinite number of these lines passing through a given set of points, additional criteria must be added to the smoothing process to achieve the desired term structure. The following 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
- $$y = a + bx + cx^2 + dx^3$$
- 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 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 $5*(n-1) \times 5*(n-1)$. The matrix is formed according to the following logic:

The second derivative at the end points and the first derivative of the last point is Zero.

At the points other than the end points the value of the first derivatives, second derivatives and the third derivatives of the function are equal.

- c. Number of paths – Specifies the number of simulations to execute. The valid range is from 1 to 2100. The default is 200. If the number of rate paths is not within the range of 1 to 2100, then an error message is displayed to the user.
- d. Random Number Generation Method: To run Monte Carlo simulations, you must specify the random number generator algorithm for the rate path generation.
Low Discrepancy Sequences: Also known as quasi-random sequences, are designed to prevent clustering of generated numbers; this results in achieving better accuracy than pseudo-random sequences when applied to numerical problems; integration in high dimensions, and so on.
Pseudo Random Sequences: The traditional random numbers generated by most compilers. They are designed to do well on some statistical tests: low autocorrelation, high period before the sequence repeats itself.
- e. Seed Value: Fixed or Variable. If fixed, maximum value of 999. Fixed seed selection results in the same set of random numbers being generated with each run. If you keep the fixed seed a constant value, you will be able to reproduce results from one run to another. The variable seed option allows the system to determine the seed value randomly with each run. This option will result in a different set of random numbers for each run and hence different results from each run.

 **Note:**

Seed value selections apply to the Pseudo Random Sequences option only.

- f. Once defined, click **Apply** and you will be taken to the **Forecast Balance** screen.
4. Forecast Balances: Click the Forecast Balance box and select from the defined forecast balance rules. Click Apply.
- Maturity Mix: Select the desired Maturity Mix rule and click “apply”. For more information on how to set up the Maturity Mix, see Forecast – Maturity Mix.
 - Pricing Margins: Select the desired Pricing Margin rule from the defined list and click “Apply”. The screen will take you to Rate Index (For more information on setup details, see Forecast - Pricing Margins).

5. Rate Index: Select the rate index as it was defined in the Stochastic Rate Indexing rule, (For additional information on the setup rules for rate indexing, see Stochastic Rate Indexing. Click Apply. The screen will take you to Product Characteristics.
6. Product Characteristics: Select the desired product characteristics rule. (For more information on creating a product characteristic rule.)
 - a. Click Apply and the screen will take you to Freeze Process.
 - b. If you want to include a prepayment/early redemption, transaction strategy, output preference, or audit rule in the process, click the desired rule and define accordingly. The four are noted briefly below.

Prepayments/Early Redemptions: click the box and choose the defined prepayment rule, Click Apply (See Prepayment Rules)

Transaction Strategy: Click the box and select the defined transaction strategies for inclusion in the process. Click Apply (See Transaction Strategies)

Output Preferences options Refer to step #6 in Static Stochastic Process Rule.

Audit: Refer to Step #7 in Static Stochastic Process Rule.

7. 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.

36.2 Executing an ALM Process

Topics:

- [Using UI](#)
- [Using ICC Batch Framework](#)

36.2.1 Using UI

To run a Process ID, complete the following 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.
6. Click the View Log status to ensure run was complete.

- To view the error log, click the **Task id** number in the view log page.

Figure 36-4 View Log

The screenshot shows a web interface for viewing logs. It includes search filters for Component Type (Asset | Liability Management), Folder (ALMSEG), Task Name (test_Process), and Task ID (200073). The table below shows the results of the search.

As of Date	Component	Folder	Task Name	Task ID	Process Type	Status	Process Step	Records Processed	Number of Errors	Start Date	End Date	Elapsed Time	User	Batch Run
12/02/2020	Asset Liability Management	ALMSEG	test_Process	200073	Static Deterministic ALM Process	Completed			1	01/05/2021 18:07:12	01/05/2021 18:07:19	00:00:07	ALMUSER	OFSALMIN

Page: 1 of 1 (1-1 of 1 items) K < > X Records Per Page: 1

36.2.2 Using ICC Batch Framework

To execute the process from OFSAAI ICC framework, create a new Batch with task as Asset Liability Management and specify the following parameters for the task:

- **Datastore Type:** Select appropriate datastore from list.
- **Datastore Name:** Select the appropriate name from the list.
- **IP address:** Select the IP address from the list
- **Folder:** Select the Folder
- **Process Type:** Select the type of ALM process. Dynamic Deterministic ALM Process, Dynamic Stochastic/Historical Simulation ALM Process, Static Deterministic ALM Process, or Static Stochastic/Historical Simulation ALM Process
- **Process Name:** Select the name of ALM process
- **Optional Parameters:** Define application ID as OFS_ALM. This is a mandatory parameter for process execution.

Andrew Davidson and Company (ADCo) Prepayment Method

This chapter describes about the Andrew Davidson & Co (ADCo) prepayment method.

The Andrew Davidson & Co (ADCo) prepayment method calculates the prepayment amount for a combination of currency equal to the US Dollar and Product Account equal to Type Earning Asset. ADCo related UI inputs and the CFE execution are available with an ADCo License, where you can map the OFS ALM to the ADCo function.

37.1 Deployment of ADCo Libraries on OFSAAI

This section discusses the deployment of ADCo Libraries on OFS ALM.

Prerequisite

The following is the list of prerequisites:

- ALM 8.0
- ADCo v1.9 libraries for Loan-Dynamic-Model, for your operating system or version



Note:

ADCo is not available on IBM AIX operating systems.

Steps

To deploy the ADCo Libraries on OFS ALM, follow these steps:

Preparation

1. Log in to the UNIX Profile where the OFSAAI database-tier is installed.
2. Create a folder called **adco**, and then create three sub-folders **io**, **data**, and **lib** under **adco**.
3. 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.
4. Stop all OFSAAI services.
5. Log out of the UNIX session and log in back into UNIX. Verify that the following three environment variables created are set properly:

- ADCO_IO_DIR
 - DATAFILEDIR
 - LD_LIBRARY_PATH
6. Start all OFSAAI Services.

Deployment

1. Download the v1.9 ADCo libraries and place the file libadppmdl.so into the adco/lib subfolder.
2. Place the monthly license-key and historical-rate files into the adco/data subfolder.
3. Place the following ADCo files in the adco/io subfolder:
 - ADCO_DefaultValues_INACTIVE.txt
 - ADCO_XMLSettings_INACTIVE.txt

Enable ADCo functionality in ALM

To enable the ADCo, follow these steps:

1. Log in to OFS AAI as System Administrator.
2. Under the OFS AAI Home Page, navigate to Administration and select **Security Management**.
3. Expand **System Administrator** and select **Function – Role Map**.
4. Associate the SMS-Function **ADCO Prepayments for ALM** with the required roles.

37.2 Procedure For Setting Up ADCo Process

To set up an ADCo process, follow these steps:

1. Mapping of the ADCo function to ALM Admin user
2. Set up the 7 Indices to use with ARMs.
3. Set up the 2 year, 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 year, 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 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 ADCo prepayment method comprises utilizing the above mentioned specific settings in various ALM modules is explained in the following sections.

37.2.1 Mapping of the ADCo function

After acquiring the ADCo license, you must manually map the ADCo function to the ALM Admin user in the **Role Function Mapping** window of **Security Management**. Only after this mapping, you will be available to view the ADCo related changes made in the Forecast Rates and Prepayments windows. This does not apply to the common windows of **Rate Management** and **Application Preferences**. For more details on security management, see the [Oracle Financial Services Analytical Applications Infrastructure User Guide](#).

37.2.1.1 Rate Management

Interest Rates

In **Rate Management Interest Rates Detail** window, the Curve Identifier drop-down list contains the list of four 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 purposes, whose reference currency is always US Dollar. The seven indices are

Table 37-1 List of seven indices that are used with the Adjustable Rate Mortgages(ARMs)

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 (%)

Define the seven indices to use with the ARMs, with the same name as expected by ADCo. Also, the IRC to supply 2 year and 10 year rates also must be defined in **Rate Management** window. Do not enter the **Term structure** parameters if the IRC is to be used only for ADCo purposes.

Economic Indicators

In the **Economic Indicators Detail** window, 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 the purpose of ADCo, this step of loading the STG_LOAN_CONTRACTS table must be performed. The following columns are available in this table for ADCo purpose:

Table 37-2 STG_LOAN_CONTRACTS table

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

Run the T2T Batch to populate FSI_D_MORTGAGES table:

To run the T2T Batch to populate FSI_D_MORTGAGES table, perform the following steps:

1. Navigate to the **Common Object Maintenance** menu and select **Operations**.
2. Set up a batch in the Batch Maintenance window. For more information, see the [Oracle Financial Services Analytical Applications Infrastructure User Guide](#).
3. Execute the batch. This populates the FSI_D_MORTGAGES table. For more information, see the [Oracle Financial Services Analytical Applications Infrastructure User Guide](#).

37.2.1.2 Application Preferences

In the **ADCO Parameter** pane, an input parameter National Housing Pricing Index(NHPI) is available. This parameter is for ADCo definition purpose to select the

economic indicator defined from Rate Management. You need to set up a NHPI economic index to override the base Adco NHPI forecast. This is an optional step.

For more information, see the Application Preferences section.

37.2.1.3 Product Characteristics

The **Define Other Mortgage Attributes** tab is available only if the you have an ADCo License.

For more information, see the Product Characteristics section.

37.2.1.4 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 displayed only if the ALM_ADCO function is mapped.

- By default, the check box is not selected (or check box is not displayed), and the window continues to display its existing behavior.
- If you select the check box, then this window shows **360 Month** option and the date display follows the MMM-YYYY format.

Forecasting the 7 indices is similar to forecasting the 2 year and 10 year rate IRCs having term points as 2 years and 10 years.

For more information, see the Forecast Balance Rules section.

Economic Indicator (EI) Forecast Methods

The Economic Indicator window has a similar behavior for Economic Indicator Forecasting method of DirectInput. But, UI checks for the National HPI Selection in Application Preferences. The Audit option for ADCo is displayed in the ALM Process window only if the ALM_ADCO function is mapped. Forecasting the NHPI is an optional step.

For more information, see the Forecast Balance Rules.

37.2.1.5 Prepayments

Oracle Asset Liability Management provides five prepayment calculation methods: Constant, Prepayment Model, PSA, Arctangent, and ADCo (Andrew Davidson and Co.) Prepayment.

For more information, see the Prepayment Rules section.

Defining the ADCo Prepayment Method:

To define prepayment assumptions using the ADCo Prepayment method, follow these steps:

Prerequisites:

Performing basic steps for creating or updating a Prepayment rule.

To define the ADCo Prepayment Method, follow these steps:

1. Select the currency as US Dollar and Product Account Type as an Earning Asset.
2. Select ADCO Prepayment method from the Prepayment Method drop-down list. The Prepayment UI shows the ADCO Prepayment method as an available method in the drop-down list, only if the ALM_ADCO function is mapped.

3. Select **Refinance** or **Curtailment** from the **Calculation** drop-down list.
4. The ADCo Prepayment pane is displayed containing the **Index** drop-down list that 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.

37.2.1.6 Transaction Strategies

Define Other Mortgage Attributes: This tab is available only if you are mapped to an ADCo License.

For more information, see the Transaction Strategies section.

37.2.1.7 ALM Processing

Creating a Static Deterministic Process rule:

In the **Audit** block, **Output ADCo Prepayment SMM rates** check box is enabled only if you have an ADCo License. Selecting this check box is an optional step. Select this check box to capture the SMM rates for each scenario, As of Date, instrument, Product Leaf, Remaining Term, and 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.

Error Scenarios

- ALM Engine logs error messages into FSI_PROCESS_ERRORS if ADCo method is assigned to a non-Mortgage and process the next record. This validation check is based on the Instrument type.
- ALM Engine logs warning messages into FSI_PROCESS_ERRORS if the input parameters required are missing from the Mortgages table.
- ALM Engine logs error messages into FSI_PROCESS_ERRORS if forecast rates scenario definitions are inconsistent or the definition is missing. 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 forecast.

CD/MLS tables for ADCo

The following CD/MLS tables are available for ADCo:

Table 37-3 List of CD/MLS tables used for ADCo

Table Name	Display Name	Description
FSI_DELIQUENCY_STATUS_CD	Delinquency Status Cd	Holds Data For Delinquency Status Cd
FSI_DELIQUEN_STATUS_MLS	Delinquency Status Mls	Holds Data For Delinquency Status Mls

Table 37-3 (Cont.) List of CD/MLS tables used for ADCo

Table Name	Display Name	Description
FSI_DOCUMENTATION_CD	Documentation Cd	Holds Data For Documentation Cd
FSI_DOCUMENTATION_MLS	Documentation Mls	Holds Data For Documentation Mls
FSI_GEOGRAPHIC_LOC_ST ATE_CD	Geographic State Cd	Holds Data For Geographic State Cd
FSI_GEOGRAPHIC_LOC_ST ATE_MLS	Geographic State Mls	Holds Data For Geographic State Mls
FSI_ISSUER_CD	Issuer	Holds Data for Issuer Cd
FSI_PPMT_MODEL_INDICES _CD	Ppmt Model Indices Cd	Holds Data For Prepayment Model Indices Cd
FSI_LOAN_TYPE_CD	Loan Type Cd	Holds Data For Loan Type Cd
FSI_LOAN_TYPE_MLS	Loan Type Mls	Holds Data For Loan Type Mls
FSI_O_SMM_RATES_AUDIT	Single Monthly Mortality Rate Audit Table	Single Monthly Mortality rate audit
FSI_PPMT_MODEL_INDICES _MLS	PPMT Model Indices Mls	Holds Data For Prepayment Model Indices Mls
FSI_PREV_DELQ_STATUS_C D	Prev Delq Status Cd	Holds Data For Previous Delinquency Status Cd
FSI_PREV_DELQ_STATUS_ MLS	Prev Delq Status Mls	Holds Data For Previous Delinquency Status Mls
FSI_PROPERTY_PURPOSE_ CD	Property Purpose Cd	Holds Data For Property Purpose Cd
FSI_PROPERTY_PURPOSE_ MLS	Property Purpose Mls	Holds Data For Property Purpose Mls
FSI_PROPERTY_SUB_TYPE _CD	Property Sub Type Cd	Holds Data For Property Sub Type Cd
FSI_PROPERTY_SUB_TYPE _MLS	Property Sub Type Mls	Holds Data For Property Sub Type Mls
FSI_PURPOSE_CD	Purpose Cd	Holds Data For Purpose Cd
FSI_PURPOSE_MLS	Purpose Mls	Holds Data for Purpose Mls

37.3 ADCo Mapping

This section describes about the ADCo mapping details.

Table 37-4 ADCo Mapping details

Column Mapped Used	Input ADCo
CUR_MIN_PMT	CurMinimumPayment
LOAN_DOC_STATUS	Documentation
FIRST_RESET_AGE	FirstResetAge
FIRST_RESET_CAP	FirstResetCap
FIRST_RESET_FLOOR	FirstResetFloor
PMT_OPTION_FLG	HasOptionalPayment
NO_INT_ONLY_MTHS	IOMonths
RELO_LOAN_FLG	IsRelo
SUB_PRIME_FLG	IsSubprime
LIEN_POSITION	LienPosition
MORT_INS_CUTOFF	MI_Cutoff
MORT_INS_PREMIUM	MI_Premium
MORT_INS_AMT	MIAmount
NO_LAST_DELQ_MTHS	MonthsSinceLastDelinquency
NO_PROPERTY_UNITS	NumUnits
ORG_CUST_LTV	OrigCombinedLTV
RATE_INCR_CYCLE	PeriodicCap
RATE_DECR_CYCLE	PeriodicFloor
NO_PREPAY_PENALTY_MTHS	PPMonths
PREV_DELQ_STATUS_CD	PreviousDelinquency
GEOGRAPHIC_LOC_STATE_CD	State
CUR_LOAN_TO_VALUE	Cur_LTV
PREPAY_INDEX	Index
JOINING_SCORE	Credit_Score
CUR_PAR_BAL	Cur_Face
FICO_SCORE	CurFICO
MARGIN_GROSS	GrossMargin
RATE_CAP_LIFE	LifeCap
RATE_FLOOR_LIFE	LifeFloor
PURPOSE_CD	Loan_Purpose
NEG_AMRT_LIMIT	MaxNegAm
REPRICE_FREQ	MonthsBetweenReset

Table 37-4 (Cont.) ADCo Mapping details

Column Mapped Used	Input ADCo
PROP_PURPOSE_CD	Occupancy
ORG_NET_PAR_BAL_C	Orig_Face
ORG_LOAN_TO_VALUE	Original_LTV
ORG_TERM	OriginalTerm
PMT_INCR_CYCLE	PayCap
PROP_SUB_TYPE_CD	Property_Type
MATURITY_DATE, AS_OF_DATE	RemainingTerm
CUR_GROSS_RATE	StartingWac
adjustable_type_cd	WacIsFixed
PROPERTY_ZIP_CODE	ZipCode
NO_BALLOON_MTHS	BalloonMonths
FIRST_FORECAST_MTH	FirstForecastMonth
FIRST_FORECAST_YR	FirstForecastYear
AGE_ON_BOOK	Age
RATE_SET_LAG	LookBackMonths
ORG_RATE	WAC

37.4 Limitations

Support for ADCo when using FTP Forecasting methods, is not currently supported. This will be available when the FTP application supports ADCo in future.

Moody's WSA Integration with OFS ALM

This chapter discusses the procedure for Moody's integration with OFS ALM.

Moody's Analytics has a model - WSA libraries, which generate structured security cash flows. This functionality must support the modeling of structured products (ABS/MBS CMO's, and CDO's). In OFSAA ALM, 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, 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 security 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 ALM processing. The input assumption information is passed to the Moody's model, so their model will produce cash flows for a given tranche of the 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 the Moody's cashflow libraries in OFS ALM, You must procure a license to the WSA libraries from Moody's Analytics.

38.1 Deployment of Moody Libraries on OFS ALM

This section discusses the deployment of Moody Libraries on OFS ALM.

Prerequisite

The following is the list of prerequisites:

- ALM 8.0
- A license for the WSA libraries is required from Moody's

Steps

To deploy the Moody Libraries on OFS ALM, follow these steps:

- Preparation:
 1. Log in to the UNIX Profile where OFSAAI Database-tier is installed.
 2. Create a folder called **moody**, and then create two subfolders under **moody** : **data** and **lib64**
 3. Edit the .profile script and set the following environment variables
MOODYS_DATA_PATH: Set to the absolute path of the **data** subfolder created above

LD_LIBRARY_PATH: Update this environment variable to include the absolute-path of the **lib64** subfolder.

ADCO_DATA_PATH: Set to the absolute path where ADCo historical-rate files are present.

This is only required if you are using the Moody's libraries along with ADCo prepayment model. For more information on ADCo LDM prepayment model, see the [Prepayment Rules](#) section.

4. Stop all OFSAAI services
 5. Logout of the UNIX Session and log back into UNIX. Verify that the created environment variables are set properly.
 6. Start all OFSAAI Services
- **Deployment:**
 1. Download the Moody's libraries and place the files into the moody/lib64 subfolder.
 2. Place the deal files in the **Moody's** data folder.
 - **Enable Moody functionality in ALM:**
 1. Login to OFSAAI with the SYSADMN credentials.
 2. Under the OFSAAI Home Page, navigate to **Administration** and select **Security Management**.
 3. Expand System Administrator and click **Function – Role Map**.
 4. Associate the SMS-Function **Moody Integration for ALM** with the required roles to the required username.

38.2 Moody's Integration – Considerations

This section discusses the integration of Moody Libraries with OFS ALM.

38.2.1 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's 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, you 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 ALM engine.
- If the you have 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 process. For example: If you populate loans and securitized products in the FSI_D_ASSET_BACK_SEC table, the loan records would not be processed in the table.
- OFSAA ALM 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 the upstream system to use, if required.

38.2.2 WSA Engine and OFSAA Rate Management

Interest Rate Curves required for Moody's should be setup 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)

You are responsible to set up the proper curves while using Moody's libraries. You can define only one Treasury Curve or one LIBOR curve or one COFI curve, and one prime curve per currency.

A majority of the deals would be based on LIBOR or Treasury Curves.

38.2.3 WSA Engine and OFSAA Product Characteristic Definition

The **Model Integration** tab is used for Moody's WSA Integration. This tab is enabled only for the account types "Structured Products - Assets" and "Structured Products - Liabilities".

Model Selection, Tuning, and tuning parameters for the selected model can be passed through **Model Integration** in the **Product Characteristic** UI.

You should logically branch the deals (RMBS, CMBS, SLABS, Credit Cards) in their hierarchy for modeling the behavior in the following ways:

- **Passing the assumptions from a table:** You can choose to pass the following assumptions (listed Table) through the FSI_D_BEHAVIOR_ASSUMPTIONS table. These are read from the table and applied to the deal with the matching INSTRUMENT_NUM in the instrument table. In the Model Selection window, you have to select Source system provided against the particular node for modeling with the user-provided assumptions.

Table 38-1 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.

Table 38-1 (Cont.) Assumption Types/Subtype Details:

ASSUMPTION TYPE	ASSUMPTION SUBTYPE	DESCRIPTION
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): 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
DEFAULT	DEFAULT_CURVE_SEASONED_CDR	
DEFAULT	DEFAULT_CURVE_SEASONED_MDR	
DELINQUENCY		A pointer to data for from 30 to 59 day's delinquency.
DELINQUENCY		A pointer to data for from 60 to 89 day's delinquency.
DELINQUENCY		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

Table 38-1 (Cont.) Assumption Types/Subtype Details:

ASSUMPTION TYPE	ASSUMPTION SUBTYPE	DESCRIPTION
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 you are passing assumptions, for example, the Prepayment vector, the subtype values can be in; – PSA, SMM, CPR, HEP, and ABS. You must they are passing the correct and acceptable subtype 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. A deal would have all three vectors available.
- ADCo prepayment and default modeling: You 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.

38.2.3.1 Tuning Parameters

Tuning is available to allow you to customize the assumptions being provided to the Moody's WSA engine.

For Source System Provided

The following parameters are available :

Table 38-2 List of Tuning parameters for Source System Provided

Tuning Parameter	Description	Default Value
Prepayment	The magnitude for a prepay rate	1
Default	The magnitude for a 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 the mortgage draw rates	1
Servicer Advancing	NONE/INTEREST/BOTH	None

For ADCO:

Additionally, the following parameters are available:

Table 38-3 List of Tuning parameters for ADCo

Tuning Parameters	Description	Default
ficoToUseIfNotAvailable	FICO to use for loans that do not have this INFO.	680
ficoSubprimeThreshold	The loan is considered sub-prime 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

38.3 Setting-up a Moody's Process

Follow these steps to set up a Moody process:

1. Mapping the Moody's function to the ALM user
2. Set up the curves needed for the 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 Discount Methods - only required for valuation. For more details on ADCo 360 Bucket forecasting, see the Forecast Rate Scenarios section.
7. Setup the Static/Dynamic Deterministic Process including the rules defined (Product Characteristic, Forecast Rates, and Discount Methods). New Business is desupported for Securitized products.
8. Select the **Structured Product Output** flag (optional) to update the instrument records.
9. Execute the Process.

38.4 Limitations

The following is a list of limitations:

- New business not supported for Dynamic Deterministic processing.
- WSA libraries are only available on Linux Operating Systems (5 and 6).

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.

39.1 Partial Aggregation

An extra filter option is given in the Stratification Definition, which limits the stratification, only for the accounts in the Source Table falling under the filter criteria. If the Filter is not being used, (case for all existing definitions), then the existing behavior remain as is.

For accounts in the Source Table, which does not satisfy the filter condition will not be aggregated and will be moved to the destination table as is. But whether column mappings which are defined in aggregation tab and under defaults will be applicable or not for non-aggregated records, will be dependent on the check-box Apply Column mapping for Non-Aggregated Accounts. If this check-box is selected, then the aggregated records column mappings will be applicable to the non-aggregated records. Else the non-aggregated records will be moved to the destination aggregated table without using the column mappings

39.2 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.

39.3 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.

39.4 Stratification Tips

Consider this criteria 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.



Note:

Unique Constraint on all Aggregated tables is the same as other instrument tables with ID Number and Identity Code. In order to preserve uniqueness, DEFAULT value should not be used for ID_NUMBER and IDENTITY_CODE mappings. MIN/MAX should be used for these fields accordingly.

39.5 Setting up Stratification Definitions

This section discusses how to setup stratification definitions.

Table 39-1 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.

39.5.1 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 39-1 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.

39.5.2 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 39-2 Stratification Tier – Definition page

The screenshot shows the 'Stratification Tier Definition' page. The form includes the following fields and controls:

- Name:** CS Cur Book Bal Tiers
- Description:** Tier definition for Current Book Balance
- Tier Type:** TIER
- Data Type:** BALANCE

Below the form is the 'Defined Tiers' section, which includes a table of 'Defined Ranges' and input fields for 'Lower Bound' and 'Upper Bound'.

Lower Bound	Upper Bound
0.01	100000
100000.01	1000000
1000000.01	100000000

The page also includes 'Add', 'Update', and 'Remove' buttons for the defined tiers, and 'Save', 'Save As', and 'Cancel' buttons at the bottom.

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 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.

39.5.3 Setting up Stratification Definitions

This section discusses how to setup 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.

39.5.4 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 39-3 Stratification Rules Definition page

The screenshot shows the 'Stratification Rules Definition' window with the 'Definitions' tab selected. The 'Definition' section contains the following fields and values:

- Name: CS Agg 1
- Description: CS Agg test 1
- Source Table: Loan Contracts
- Target Table: Loan Contracts Aggregate
- Output Rules Table Name: CS Agg 1_522995
- Catch All Bucket:

Buttons for 'Apply', 'Save', and 'Cancel' are visible at the bottom of the form.

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 39-4 Stratification Rules Definition – Defaults tab

The screenshot shows the 'Stratification Rules Definition' window with the 'Defaults' tab selected. The 'Defaults' section contains the following fields and values:

- Amount Columns: AVG
- Date Columns: MAX
- AlphaNumeric Columns: MIN
- Rate Columns: WeightedAvg
- Integer Columns: MIN

Buttons for 'Apply', 'Save', 'Save As', and 'Cancel' are visible at the bottom of the form.

To define Stratification Defaults, follow these steps:

1. Select the Amount default. Possible selections are MAX, MIN, SUM, AVG. The recommended selection is SUM.
2. Select the Date default. Possible selections are MAX, MIN, MEDIAN. The recommended selection is MEDIAN.
3. Select the AlphaNumeric default. Possible selections are MAX, MIN. The recommended selection is MAX.
4. 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.

5. Select the Integer default. Possible selections are MAX, MIN. The recommended selection is MAX.
6. 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 39-5 Stratification Rules Definition – Aggregation tab

To define Stratification Aggregation details, follow these steps:

1. 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.
2. 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.
3. 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:

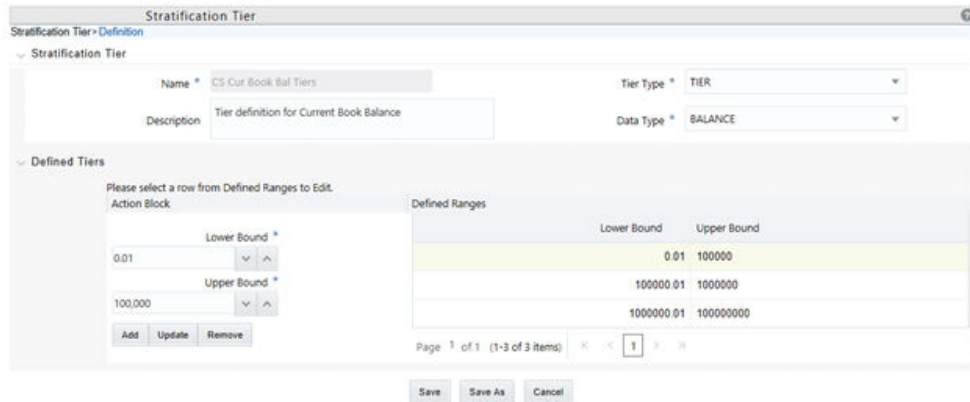
1. Select the Column(s) and Stratification Action that you want to use for grouping the detailed records into aggregate/pooled records. Typical columns used for grouping will be dimension columns, balance or rate columns, or any other meaningful columns that you want to be unique for each pool record.
2. 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.
3. Select Apply to save your inputs and remain in the rule or select Save to save your inputs and close the rule.

39.5.5 Defining Stratification Tiers

To define stratification tiers, follow these steps:

1. Navigate to Common Object Maintenance, select Stratification, and then select Stratification Tier.

Figure 39-6 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.

39.6 Creating New Aggregate Table

The following aggregate tables are seeded with the Application Data Model:

Table 39-2 Seeded Aggregation Tables with the Application Data Model

#	Logical name	Physical table name
1	Annuity Contracts Aggregate	FSI_D_ANNUIITY_CONTRAC TS_AGGR
2	Borrowings Aggregate	FSI_D_BORROWINGS_AGG R
3	Checking And Savings Accounts Aggregate	FSI_D_CASA_AGGR
4	Credit Cards Aggregate	FSI_D_CREDIT_CARDS_AG GR
5	Credit Lines Aggregate	FSI_D_CREDIT_LINES_AGG R

Table 39-2 (Cont.) Seeded Aggregation Tables with the Application Data Model

#	Logical name	Physical table name
6	Guarantees Aggregate	FSI_D_GUARANTEES_AGG R
7	Investments Aggregate	FSI_D_INVESTMENTS_AGG R
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_A GGR
11	Mortgages Aggregate	FSI_D_MORTGAGES_AGGR
12	Retirement Accounts Aggregate	FSI_D_RETIREMENT_ACCO UNTS_AGGR
13	Term Deposits Aggregate	FSI_D_TERM_DEPOSITS_A GGR

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.

39.7 Executing a Stratification Rule

To execute a stratification rule, follow these steps:

1. Navigate to the **Stratification Rule Summary** page.

Figure 39-7 Stratification Rules

The screenshot shows the Oracle Financial Services Funds Transfer Pricing application interface. At the top, there is a search bar and a table of stratification rules. The table has the following columns: Name, Created Date, Created By, Last Modified, Modified By, Executed By, Executed On, and Execution Status. The table contains five rows of data. A red arrow points to the 'Execute' button in the toolbar above the table.

Name	Created Date	Created By	Last Modified	Modified By	Executed By	Executed On	Execution Status
11	10/31/2018 11:34:25	ALMUSER	10/31/2018 11:34:30	ALMUSER			
34534	10/15/2018 17:20:36	ALMUSER	11/23/2018 14:45:51	ALMUSER			
3456456	10/15/2018 17:15:37	ALMUSER	10/15/2018 17:20:39	ALMUSER			
CS Agg 1	01/28/2019 22:00:45	ALMUSER	01/28/2019 22:39:51	ALMUSER			
test15	10/15/2018 17:13:20	ALMUSER	01/28/2019 21:56:46	ALMUSER	ALMUSER	10/15/2018 17:16:29	Success

2. Select the Stratification Rule you want to process.

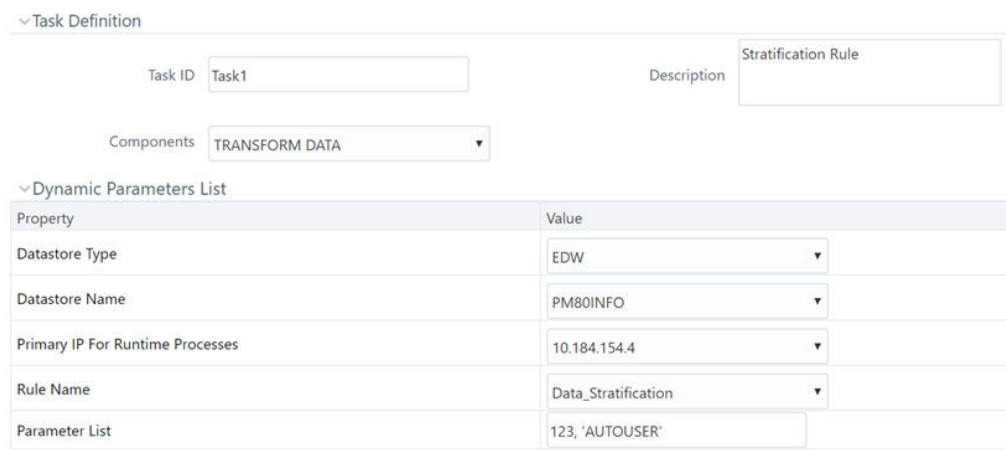
3. Select the **Run** icon.
4. Select the **As-of-Date** for the instrument data you want to aggregate.
5. Select **OK** to begin the process.

39.7.1 Using ICC Batch Framework

To execute the procedure from OFSAAI ICC framework, create a new Batch with 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 39-8 Stratification using ICC Batch Framework



Task Definition	
Task ID	Task1
Description	Stratification Rule
Components	TRANSFORM DATA
Dynamic Parameters List	
Property	Value
Datastore Type	EDW
Datastore Name	PM80INFO
Primary IP For Runtime Processes	10.184.154.4
Rule Name	Data_Stratification
Parameter List	123, 'AUTOUSER'

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 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.

39.7.2 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;
```

40

Metadata Browser

The Asset Liability Management under Oracle Financial Services Analytical Applications has the Metadata Browser (MDB). The MDB window displays RRF Runs in application view and ALM objects in object view.

For more information, see the [Metadata Browser User Guide Release 8.1](#).

41

Performance Tuning

This section provides information about configuring certain Oracle Financial Services applications for application multiprocessing through the Process Tuning User Interface.

Note: The Process Tuning User Interface is available for definition ONLY for a User who has a role mapping of **Administrator** or **Auditor**. The **Auditor** role mapped user has **READ-ONLY** access to the Process Tuning UI.

Both the Asset Liability Management (ALM) and Funds Transfer Pricing (FTP) applications involve processing large quantities of data and the goal of all customers is to reduce processing time so they have more time to focus on the analysis of the results. Generally, the process execution window is closely related to the volume of data it operates on, underlying metadata definitions, in-memory calculations, processing individual calculation elements/selections (for example, transfer pricing method, propagation, account-level cash flows, financial elements), and so on. To achieve optimal performance, application Process Tuning allows application administrators to specify the number of concurrent subprocesses to launch for each application process that is initiated and also allows users to define how to slice the data for each subprocess. This process is described in the following sections.

The following are the basic guidelines, that must be considered to achieve optimal performance.

Topics

- [Application Process Tuning](#)
- Performance Tuning Applicable to FTP
- Performance Tuning Applicable to ALM

41.1 Application Process Tuning

Topics:

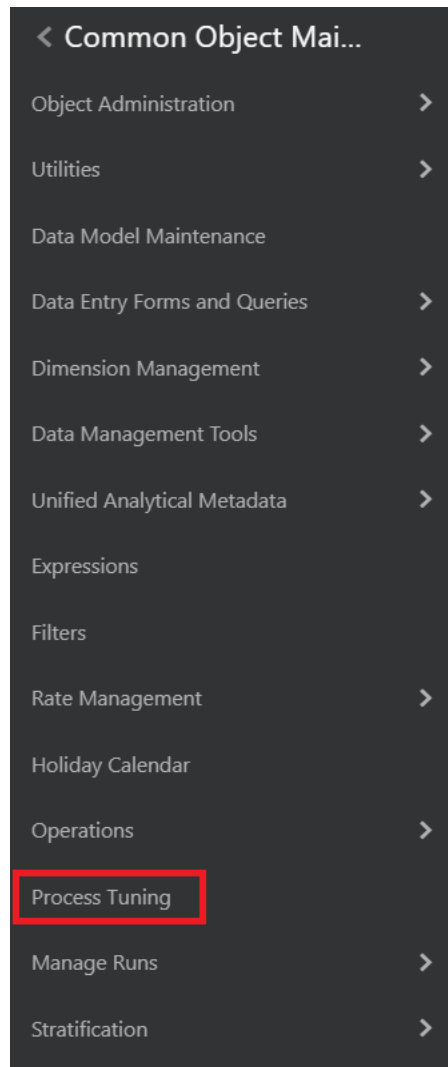
- [Defining Multiprocessing Parameters](#)
- [Application Multiprocessing Model](#)
- [Multiprocessing Options](#)
- [Tuning Application Multiprocessing](#)

For more information on OFSAA Process Tuning Options, see the OFSAA support Doc ID 1307766.1

41.1.1 Defining Multiprocessing Parameters

Access the multi-processing/tuning UI under the **Common Object Maintenance** on the **LHS** menu.

Figure 41-1 Navigation to Process Tuning UI



This opens the Process Tuning Options Summary window which is the gateway to perform all the required Process Tuning Options-related functionality.

Figure 41-2 Process Tuning Options Summary page

Process Tuning Options Summary

Search

Rule Type

Folder Name

Rule Step

Rule Name

Available Process Tuning Options

Rule Type	Rule Step	Rule Name	Partition Type	Number of Processes	Commit Frequency	Array Row Size	Data Slice Type
Asset Liability Management	Client Data by Prod, Org	All	Cooperative	1	50	50	No Slicing
Asset Liability Management	Client Data by Prod, Currency	All	Cooperative	1	50	50	No Slicing
Asset Liability Management	Monte Carlo Client Data	All	Cooperative	1	50	50	No Slicing
Asset Liability Management	Client Data by Prod	All	Cooperative	1	50	50	No Slicing
Funds Transfer Pricing	All	All	Dedicated	1	10	10	Distinct Values

The application installation process seeds default multiprocessing parameters. By default, multiprocessing is disabled for all applications. It can be enabled by inputting specific settings for the following applications:

- Asset Liability Management – Deterministic and StochasticProcessing
- Funds Transfer Pricing – Standard and StochasticProcessing

Follow these steps to define multiprocessing parameters :

1. From **Process Tuning Options Summary** page click **Add** to create a new Process Tuning assumption. You can create only one process tuning assumption per combination of Rule Type and Rule Name.
2. Select the Assignment LevelDetails:
 - Folder Name
 - Rule Type
 - Rule Step
 - Rule Name
3. Define multi processing parameters:
 - PartitionType
 - Array Row Size
 - Number of Processes
 - Commit Frequency
4. Select the Data slice type
5. Select Data slicing columns

Details for each step are explained in the following sections:

- [Assignment Levels Details](#)
- [Parameter Specification](#)
- [Multiprocessing Options](#)

- [Engine Overrides](#)

For each step, the relevant multiprocessing parameters are described. Some applications override the configuration to handle special processing conditions. The [Engine Overrides](#) section explains these special processing conditions.

41.1.1.1 Assignment Levels Details

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 supports multiprocessing assignments at multiple 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 as follows:

- Specific step of a specific process for an engine
- All steps of a specific process for an engine
- Specific step of all processes for an engine

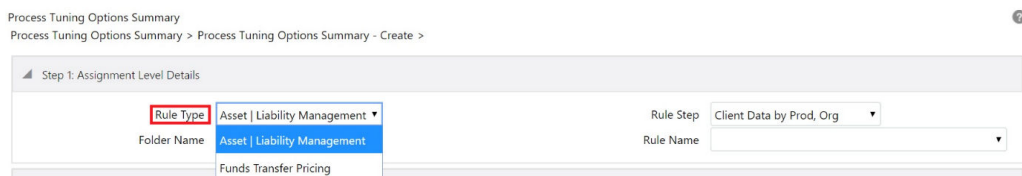
Multiprocessing assignments can be done at the following levels:

- [RuleType](#)
- [RuleStep](#)
- [RuleName](#)

Rule Type

When specifying multiprocessing parameters at the Rule Type level, all Rule Names for that Rule Type are processed with the designated parameters.

Figure 41-3 Rule Type drop-down on Process Tuning Option Summary page



The following table describes the valid Rule Type values present in the **Rule Type** drop-down list

Table 41-1 Rule Types

Process Engine Code	Rule Type	Description
2	Asset Liability Management	Asset Liability Management Process
3	Funds Transfer Pricing	Funds Transfer Pricing Process

Rule Step

The Rule Step identifies a particular phase of an OFSAA process. They are reserved names specific to each Rule Type.

Figure 41-4 Rule Step drop-down on Process Tuning Option Summary page

Rule Step is a drop-down list that is filtered based on its mapping to the selected Rule Type. The following table provides the valid combinations of Rule Type and Rule Step:

Table 41-2 Rule Types

Process Engine Code	Rule Type	Rule Step
2	Asset Liability Management	Client Data by Prod
2	Asset Liability Management	Client Data by Prod, Org
2	Asset Liability Management	Client Data by Prod, Currency
2	Asset Liability Management	Monte Carlo client data
3	Funds Transfer Pricing	All

Rule Name

Users can optionally specify multiprocessing parameters at the Rule Name level to override any parameters assigned at the Rule Type or Step 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 Rule Type or Step level is sufficient.

Figure 41-5 Rule Name drop-down on Process Tuning Option Summary page

The **RuleName** drop-down list displays the list of processes defined in Asset Liability Management or Funds Transfer Pricing applications within the specified folder. This is controlled by the value selected in **RuleType**.

41.1.1.2 Parameter Specification

In this step, the following parameters are associated with Rule Types and/or Rule Names:

- [PartitionType](#)
- [Number ofProcesses](#)
- [Array Row Size and CommitFrequency](#)

Figure 41-6 Parameter Specifications on Process Tuning Option Summary page

Partition Type

Partition Type selection is required when table partitioning is used within your instrument tables. This drop-down list displays the following values:

Table 41-3 Partition Codes

Partition Type Code	Description
0	Single
1	Cooperative
2	Dedicated

If no partitioning is required, then the default selection of “Single” should be selected. If partitioning is required, then users should select either Dedicated or Cooperative. For more information on these selections, refer to the Multiprocessing Options > Unit of Work servicing section

Number of Processes

The number of process selection indicates the number of concurrent subprocesses to be launched by the engine. Typically, the number of subprocesses should be less than or equal to the number of CPUs available on the server. Experiment with the number of processes setting to find the optimal value.

Array Row Size and Commit Frequency

The number in the Array Row Size column sets the number of updates sent to the database. Commit Frequency is the number of rows after which the process commits changes.

The array update enables users to specify the number of rows updated using a single cursor. Array updating accumulates updated rows during processing until the defined update frequency is reached and then sends the updates to the database for processing.

You must do some trials to set these at the optimal level. Commit frequency can be set as 999 and arraysize 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.

Oracle recommends the following to set commit frequency forALM:

- If only **Process Cash Flow** writing is applicable as part of process definition then use Commit Frequency optimally greater than 0.
- If **Process Cash Flow** writing is not applicable but output to `RES_DTL`, `CONS_DTL`, and so on as part of process definition then the Commit Frequency should be set to 0 if the commit is required at end of unit-of-work.

- If both **Process Cash Flow** and output to RES_DTL, CONS_DTL are applicable then set Commit Frequency greater than 0 to see the benefits of Process Cash Flow Bulk Processing. If the commit is required at end of unit-of-work then set it to 0.

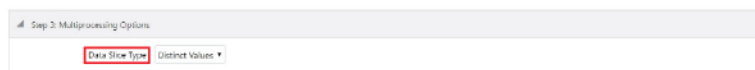
41.1.1.3 Multiprocessing Options

Multiprocessing options include the following selections:

- Data slice type
- Data slice columns

Data Slice Type

Figure 41-7 Data Slice Type Selection on Process Tuning Option Summary page



Data Slice Type is a static drop-down list with two values. You should choose distinct values to enable multiprocessing. After choosing distinct values, you must further select their Data Slicing columns.

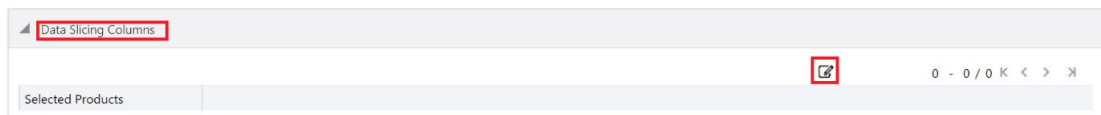
Table 41-4 Data Slice types

Data Slice Type Code	Description
1	Distinct Values
2	No Slicing

Data Slicing Columns

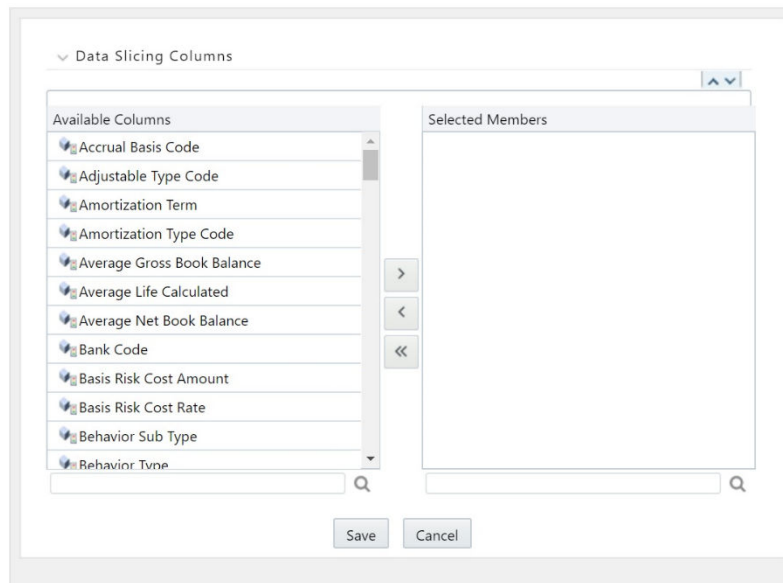
Choose the edit option to open the Data Slicing Columns window to select the slicing columns.

Figure 41-8 Data Slicing Columns on Process Tuning Option Summary page



This window contains all numeric columns of portfolio table class. The columns with null values cannot be used for data slicing

Figure 41-9 Data Slicing Column selection



Columns selected in the pop-up window are displayed on the main page

Figure 41-10 Selected Data Slicing Columns



Columns should be selected so that the instrument data can be broken down into equal segments to efficiently utilize the maximum amount of processing power. It is noted that using dimensions like the product, organization unit, and so on do not always lead to creating equal data segments. To address the requirement for uniformity in creating optimal data segments, a seeded dimension 'Data Slice' is available in both ALM and FTP that can be used to distribute instrument data evenly and balance the load across all active workers for certain types of processes.

For more information on using the Data Slice dimension, see the Data Slicing section of [OFSA Data Model Utilities Guide](#). Also, see the [Engine Overrides](#) section.

Engine Overrides

For certain conditions, the OFSAA processing engines override the multiprocessing definition for an assignment level. The overrides are as follows:

Funds Transfer Pricing

Funds Transfer Pricing 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. Different steps in the same processing run can use additional slicing columns. Bulk and propagation calculation steps, as well as Non-Cash Flow and Management Ledger pricing/migration runs, use the `ORG_UNIT_ID`

column as an additional slicing column. The Cash Flow Transfer Pricing step also uses the `ORG_UNIT_ID` column if not combined with Option Cost Calculations. For Option Cost Calculation, the engine employs `ORIGINATION_DATE` as the primary slicing column with the Product Leaf Column as secondary.

Asset Liability Management

Asset Liability Management 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 Asset Liability Management engine adds more slicing columns based upon the parameters specified in the Asset Liability Management Process, as follows:

- If the **Product/Organizational Unit functional dimensions** are selected, the engine adds `ORG_UNIT_ID` as an additional slicing column.
- If the **Product/Currency functional dimensions** are selected, the engine adds `ISO_CURREN- CY_CD` as an additional slicing column
- If the **Product/Organizational/Currency functional dimensions** are selected, the engine adds `ORG_UNIT_ID` and `ISO_CURRENCY_CD` as additional slicing columns

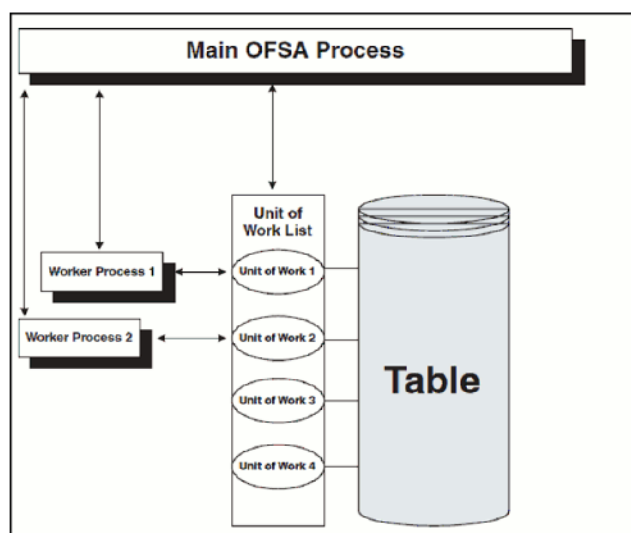
41.1.2 Application Multiprocessing Model

OFSAA application 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 are 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-worklists
- Defining how the worker processes service the unit-of-worklists

The specifics of each option are discussed. The following diagram illustrates the basic multiprocessing principles:

Figure 41-11 Basic Multiprocessing principles



1. The main process makes a list of all units of work that must be processed.
2. The main process spawns worker subprocesses. Each worker subprocess is assigned a unit of work by the main process.
3. When all units of work have been completed, the worker subprocess exits and the main process finishes any clean-up aspects of processing.
4. During processing the following is true:
 - Each worker subprocess must form its database connection.
 - A unit of work is processed only by a single worker subprocess.
 - Different units of work are processed at the same time by different worker subprocesses.

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. Oracle recommends that users choose dimensions or combinations of dimensions that produce an equal distribution of data records.

41.1.3 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 these settings for your use through the process tuning user interface as described above. This section provides more details for the different Multiprocessing options as further background. 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 (`PROCESS_DATA_SLICES_CD`) assignment. The Data Slicing Code includes 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 can 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. Any numeric column or columns in a portfolio table can be used for data slicing.

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 large tables and indexes by enabling you to decompose them into smaller and more manageable pieces called partitions. After 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 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 or Rule Step can create multiple unit-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 or columns 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 provided in OFSAA are listed in the following table. You cannot add any customized Servicing methodologies.

Table 41-5 Partition Type Codes

Partition Type Code	Description
0	Do not use partitions (Single Servicing)
1	Use shared partitions (Cooperative Servicing)
2	Use non-shared partitions (Dedicated Servicing)

Single Servicing

Single Servicing indicates that the processing engine fulfills unit-of-work requests regardless of any table partitioning. As each process completes, it requests the next unit-of-work segment, whether 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 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 that segment belongs in the same Table partition.

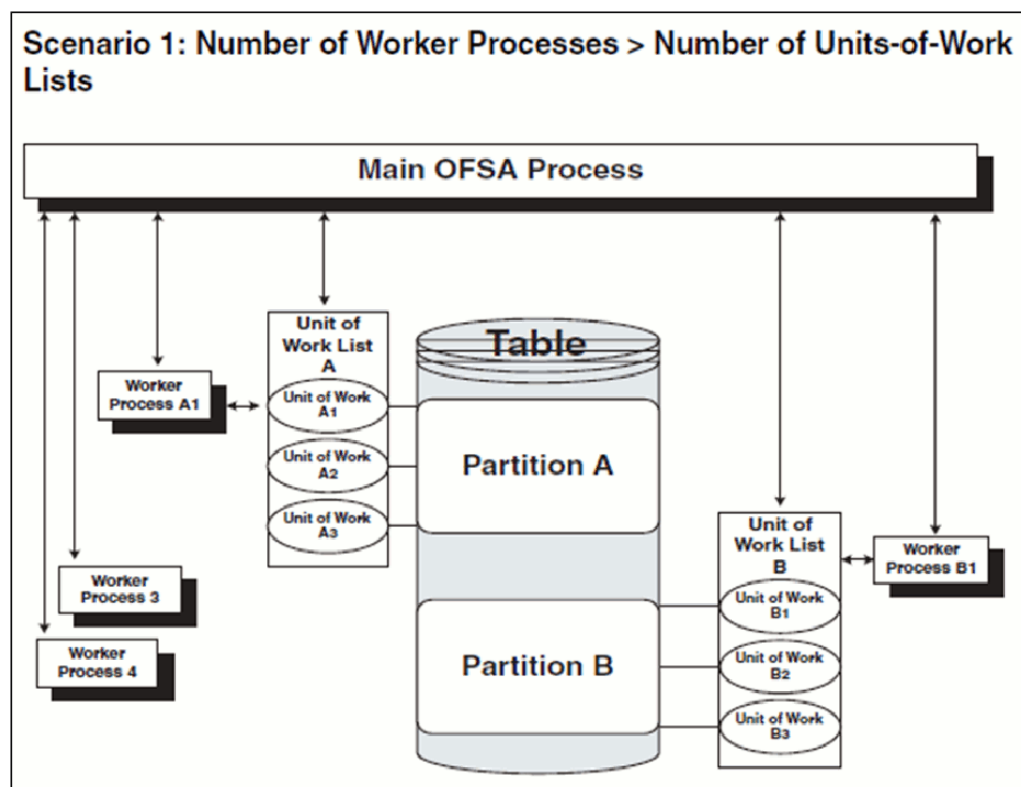
Dedicated Servicing

Dedicated Servicing indicates that the 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

Partition Type code defines how worker processes service the unit-of-work list or lists. Partition Type 'Single' results in a single unit-of-work list. All available worker processes service the list until all units of work are complete. When the Partition Type is Cooperative or Dedicated 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

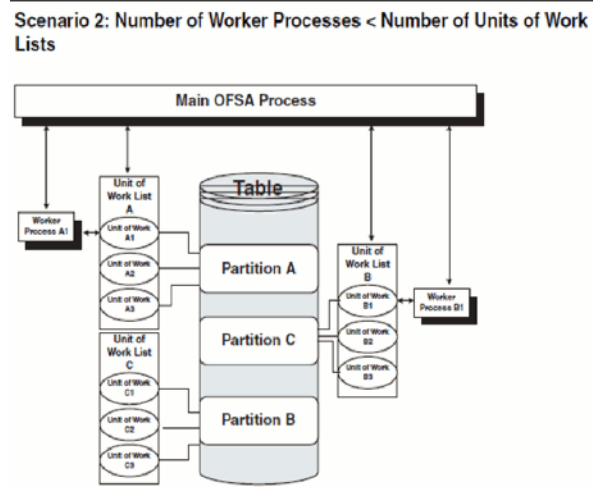
Figure 41-12 How the worker processes service multiple unit-of-work lists



- 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 assumption setup is that the Table has two partitions.
- The main process spawns four worker processes. A dedicated worker process is assigned to service each unit-of-work list, Worker Process A1, and Worker Process B1 respectively. (The setup is that the Number of Processes is 4.)

- If Partition Type is Cooperative, Worker Process 3 and Worker Process 4 assist Worker Process A1. When a unit-of-work list is complete, the available worker processes assist the dedicated worker process on their unit-of-work list.
- If Partition Type is Dedicated, Worker Process 3 and Worker Process 4 do not assist the dedicated worker processes.
- When all units of work are 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 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 41-13 How different units of work are processed at the same time by different worker processes



- The main process takes 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 that the Number of Processes is 2.)
 - If Partition Type is Cooperative, Worker Process A1, and Worker Process B1 work until all units of work are complete from all three unit-of-work lists.
 - If Partition Type is Dedicated, 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 are 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 database connection.

- A unit of work is processed only by a single workerprocess.
- Different units of work are processed at the same time by different workerprocesses.

WorkerProcesses

Worker Processes refer to the number of individual processes working simultaneously to complete the job. The Main OFSAA Process launches individual worker processes. OFSAA enables you to specify the number of worker processes for your jobs.

41.1.4 Tuning Application Multiprocessing

Tuning for optimal application multiprocessing settings is an exercise similar to tuning a database. It involves experimenting with different settings under different load conditions.

Database Bound versus Engine Bound Jobs

OFSAA jobs fall into the following two categories:

- Database bound: The jobs that spend more time within database manipulations.
- Engine bound: The 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 jobs by Application and identifies whether the job is usually database bound or Engine bound.

Table 41-6 Lists jobs by Application and identifies

Application	Job Type	Generic Job Type	Engine / DB Bound	Multiprocessing Enabled	Comments
Funds Transfer Pricing	Ledger Migration	Bulk	DB	Yes	
Funds Transfer Pricing	Bulk Transfer Pricing	Bulk	DB	Yes	Bulk methods defined via conditional assumptions will be handled row by row
Funds Transfer Pricing	Non-Cash Flow Transfer Pricing	Row by Row	DB	Yes	
Funds Transfer Pricing	Cash Flow Transfer Pricing	Row by Row	Engine	Yes	
Funds Transfer Pricing	LEDGER Migration	Row by Row	DB	Yes	

Table 41-6 (Cont.) Lists jobs by Application and identifies

Asset Liability Management	Detail Processing (Current position, Gap, Market Value)	Row by Row	Engine	Yes	All processing except Formula Results and Auto Balancing
Asset Liability Management	Formula Results	Row by Row	Engine	No	
Asset Liability Management	Auto Balancing	Row by Row	Engine	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 OFSAA processes from the Application Layer

Despite the many multiprocessing options, tuning the OFSAA database from the application layer is achieved by the following process:

- Identify the OFSAA job types that are used by your organization.
- For each job type, time the runs for a series of Number of Processes settings
- Based on the results, determine the optimal setting per application.

41.2 Performance Tuning Applicable to FTP

Management Ledger Updating

Within Funds Transfer Pricing, both Ledger migration and direct Transfer Pricing against the Management Ledger table update the Management Ledger table using inserts. This prevents OFSAA from performing Management Ledger updates in parallel. When the Management Ledger is updated (either because the Management Ledger buffer has filled or the process has ended), updating is done by only one process. All other processes must wait for updating to be completed. As the ratio between rows written to the Management Ledger and rows read from Management Ledger increases, the time spent writing to the Management Ledger dominates the time spent reading, resulting in drastically reduced scalability.

Cursor Sharing Session Parameters

You can set the Cursor Sharing database parameter at a session (FTP Application) level. This parameter, when set to **FORCE**, is observed to significantly improve FTP Processing times and Oracle recommends enabling this option.

These are not hardcoded in the engine. You must provide the right values. The Engine does not validate these values. By default, cursor sharing mode is disabled in the ofstp.ini file which is present in \$FIC_DB_HOME/conf folder:

When enabled, the Funds Transfer Pricing engine will read the CursorSharingMode parameter and set `CURSOR_SHARE` at the database session-level accordingly. The FTP Engine will execute the following statement if a value is given for **CursorSharingMode**.

```
ALTER SESSION SET CURSOR_SHARING = <Input Value in upper case>
```

<Input Values> can be: EXACT, FORCE, SIMILAR

To enable this, remove the semicolon in the ofstp.inifile as shown :

Figure 41-14 Remove ofstp.in

```
29 ; 2 -- mid level debug information (more o
30 ; 3 -- all debug information (ALL SQL, sys
31
32 [debug]
33 FileName=ofstp
34 ComponentName=Transfer Pricing Engine
35 ;CursorSharingMode=EXACT
36 ;CALC_LOG=3
37 ;ACCESS_LOG=3
38 ;ERROR_LOG=3
39
```

41.3 Performance Tuning Applicable to ALM

The following paragraphs provide tips to manage the performance of your ALM environment.

Enhance Performance with Large Payment Schedule Metadata

ALM engine takes a huge time to internally process when there is a huge volume of payment schedule metadata. As per the current design Engine queries a payment schedule table for each instrument record which would have a performance impact once instrument records grow in size. As a resolution to this issue, the engine would cache all payment schedule data at once instead and query the payment schedule table every time an instrument record is read.

In the 8.0.5.0.32 version, a new accessible table called "FSI_ALM_PROCESS_COMMON_CONFIGS" was incorporated to optimize the performance of the ALM process. This enhancement is specifically designed to efficiently handle a significant volume of payment schedules with a multiprocessing feature enabled through the process tuning screen.

This feature can be activated by manually populating the required details into the "FSI_ALM_PROCESS_COMMON_CONFIGS" table.

This feature becomes imperative under the circumstances where the ALM process is configured to operate according to the TP (Transfer Pricing) rule along with the methodology selected as the "Cash Flow Method." In the situation where the ALM process is failing with ORA errors - specifically the ORA-03146 error indicating an invalid buffer length for a TTC field, or the ORA-03106 error signifying a critical two-task communication protocol error, it becomes imperative to activate this feature.

 **Note:**

The required payment scheduled data is getting cached for the performance enhancement. Hence it is imperative to allocate an adequate amount of heap memory, commensurate with the volume of payment schedule data being considered for the given process. If there is sufficient heap memory is available, then process can be executed seamlessly. If require more heap memory, then an additional 120MB of heap memory is necessary to allocate for each one million units of payment schedule data. The increments are usually handled in multiples of 128 MB for heap.

You can configure the Infrastructure Application Memory settings as follows, and restart all OFSAA server after setting below changes and before execution of the process:

1. Locate the .profile file.
2. Edit below 2 X_ARGS fields in this file for customizing memory settings and garbage collector settings depends on the hardware configuration.

```
X_ARGS_RLEXE="-Xms2g -Xmx2g -XX:+UseAdaptiveSizePolicy -
XX:MaxPermSize=1024M -XX:+UseParallelOldGC -XX:+DisableExplicitGC"
X_ARGS_RNEXE="-Xms2g -Xmx2g -XX:+UseAdaptiveSizePolicy -
XX:MaxPermSize=1024M -XX:+UseParallelOldGC -XX:+DisableExplicitGC"
```

 **Note:**

Found the above variables setting to Increase the memory on below Oracle reference documents.

https://docs.oracle.com/cd/E99053_01/PDF/8.1.0.x/8.1.0.0.0/LRS_PerfTun/3_OFSAI_Application_Performance_Tuning.htm

<https://docs.oracle.com/en/industries/financial-services/ofs-analyticalapplications/analytical-applications-infrastructure/812/aaing/configureinfrastructure-server-memory.html#GUID-112C32F6-F947-4C0F-B051-92C24DAD7F40>

Doc ID 2349295.1

Invalid Key Processing Data

Key processing dimensions considered for ALM processing, you cannot use default values like Missing

(0) or Others (-1) in the corresponding instrument tables, otherwise, the Engine will exhibit undefined behavior or lead to hung state during process execution.

For example, if General Ledger Account is selected as Product Dimension and Organizational Unit as Organizational Unit Dimension, the Instrument Table Dimensions should contain valid values (that is, Non 0 or -1) for the process to execute successfully. Including these values will cause the Engine to hang during the Source data fetching and processing

Figure 41-15 Example of Invalid Processing Data

Dimensions and Hierarchies

Property Name	Property Value	Is Editable
Product Dimension	General Ledger Account ▼	<input checked="" type="checkbox"/>
Default Product Hierarchy	▼	<input checked="" type="checkbox"/>
Organizational Unit Dimension	Organizational Unit ▼	<input type="checkbox"/>
Hierarchy Members Navigation Size	100	<input checked="" type="checkbox"/>

Process Cash Flow Clean up

If you observe a huge amount of data present in `FSI_O_PROCESS_CASH_FLOWS` for your current process ID, then you can decide to delete cash flows from this table for that process ID before rerunning the process.

Validate Node Map

An ALM process is an assumption driven execution. Based on process configuration, it reads business assumptions from Prepayment, Discount Rate, Product Characteristic, Pricing Margin rules, and soon. In general, these assumptions can be defined at either node or leaf level.

Based on the configuration, the assumptions defined at node level can be inherited by its children which means the same definition is applied to all of its active children. As part of this process, it is necessary to execute the ALM Validate Node Map (`VALIDATE_NODE_MAP_ALM`) package.

By default, the ALM Engine executes this package whenever a process is executed or re-executed. Execution may take a long time when assumptions are defined for a large number of dimension members or are based on a very large hierarchy. In general, ensure that when defining your dimension member pool and hierarchies to keep the number of members to a minimum.

If no changes are made to the underlying hierarchies, execution of this package can be skipped (after it has been run at least once). Users can indicate when to skip execution of this procedure by adding the ALM Process ID or IDs as members of the Simple Dimension **Process Identifier Code** through the dimension management user interface. You can add a list of Process IDs for which the `VALIDATE_NODE_MAP_ALM` package execution can be excluded by adding multiple members. During the ALM process execution, the ALM Engine queries this underlying metadata table. If the process ID is present, the ALM engine will not re-execute the `VALIDATE_NODE_MAP_ALM` package. You should remove these dimension entries after any changes are made to hierarchies so the procedure can run and refresh the node map.

Operating System-Level Tuning

The operating system level performance tuning is related to Semaphores and shared memory settings.

Semaphores

Linux Semaphore settings must be set to optimal under the `SEMMSL` configuration value.

Shared Memory

The ALM Engine consumes shared memory during any ALM process execution. It is crucial to check the availability of current shared memory and tune it accordingly.

Shared memory kernel parameters must be set to optimal in the (`ofsrn.ini`) configuration file.

An out of shared memory error may be reported in ALM Engine log files during process execution. In such cases, verify and update shared memory size by updating the `SharedMemory` parameter that can be found in the `ofsrn.ini` file which is located in the `$FIC_DB_HOME/conf` directory. The default value of this parameter is 16500 KB.

Database Level Tuning

Database Level performance tuning describes a group of activities used to optimize and standardize the performance of a database. This can be improved using the following options:

- [Simple View vs Materialized View](#)
- [Cursor Sharing](#)
- [Process Cash Flows Indexes Optimization](#)

Simple View vs Materialized View

If ALM processes a huge volume of source records; a significant number of hits to the views created on REV registration tables (such as, `REV_TAB_COLUMNS_V`) can result in generating many I/O and cluster waits. These waits can spend too much process execution time querying these views only. If this occurs, change the view to a materialized view. However, you will need to maintain the changes post-installation during any future upgrade or install.

Cursor Sharing

Cursor handling within the ALM Engine can be implemented using the `CursorSharingMode` entry in the `ofsrn.ini` file as mentioned below. It is observed that setting this value to `FORCE` results in the best performance.

1. Update the `CursorSharingMode` entry in the `ofsrn.ini` file (File Location: `$FIC_DB_HOME/conf`) with the cursor sharing parameter (`EXACT`, `FORCE`, and `SIMILAR`).
2. The engine reads the value against `CursorSharingMode` and sets `CURSOR_SHARE` at that Database Session level accordingly.
3. The cursor level setting is applicable only for the process/session. The Engine executes the following statement if a value set against the `CursorSharingMode`.

```
ALTER SESSION SET CURSOR_SHARING = <Input Value in upper case>
```

<Input Values> can be: EXACT, FORCE, SIMILAR
4. If no value is supplied, then the Engine will not alter cursor sharing for that session or process.

Process Cash Flows Indexes Optimization

While persisting cash flows, the existing unique index on `FSI_O_PROCESS_CASH_FLOWS` can be dropped and an index on `RESULT_SYS_ID` should be created before running an ALM

process. Dropping the index on `FSI_O_PROCESS_CASH_FLOWS` is recommended when outputting cash flows for a large number of instrument records. After the process completes, the index should be added back.

Recommendations for Performance Improvement

While configuring an ALM process, you can choose to output detailed cash flows (either all or partial). This data is stored in the `FSI_O_PROCESS_CASH_FLOWS` table. When a process is a re-run either for the same As Of Date or for a different date, existing data for that process is first deleted before new calculations begin. When the volume of data is high this can impact overall performance. The following recommendations will help improve this:

1. Create a non-unique index on column `RESULT_SYS_ID` of the table `FSI_O_PROCESS_CASH_FLOWS`. The index is expected to make **DELETE** of existing data faster when a process is a re-run.
2. `FSI_O_PROCESS_CASH_FLOWS` can be partitioned by `RESULT_SYS_ID`. Automatic List Partitioning can be used so that partitions be added automatically when a new process is defined and executed.
3. Before executing an ALM process, existing data for that process can be removed from `FSI_O_PROCESS_CASH_FLOWS` by using **DELETE** or **TRUNCATE PARTITION**. This will ensure the engine does not spend time doing that activity.

Some other server and database level settings that can improve performance are:

1. `REDOLog` 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 the database will try to convert SQL queries generated by cash flow engine to use bind variables which will reduce hard parses and can improve performance.

These suggestions are guidelines. Consult with your database administrators and other system personnel before implementing, taking your specific infrastructure and other requirements into consideration.

Multi-Language Support

With the introduction of Multi-Locale Support, the user interfaces can be viewed in various languages.

In addition to the base language (American English or en_US), the following languages are currently supported for ALM. You can install the required Language Pack.

Table 42-1 List of Supported Languages for ALM Application

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 rule type, the Name/Description specified during create/edit is either attached to the login-locale or is stored independently of the login-locale. The selection of the login-locale governs which assumptions/rules are visible, and which are not visible. The following table 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.

 **Note:**

All Dimension Management Objects, Filters, and Expressions are visible in all languages (and therefore available for embedding), regardless of the language they were created.

Table 42-2 Visibility of Assumption rules across the supported languages

Assumption Rules	Visible across all languages	Visible only in the creation language
Common Object Maintenance		
Process Tuning		Yes
Simplified Batch	Yes	Yes
Holiday Calendar **	Yes	
SQL Rules		
Data Entry Forms and Queries		
Dimension Management (Attributes, Members, and Hierarchies)		
Filters		
Expressions		
Common Object Maintenance and select Rate Management		
Interest Rate Codes **	Yes	
Currencies **	Yes	
Economic Indicators **	Yes	
ALM Maintenance		
Behavior Patterns	Yes	
Payment Patterns **	Yes	
Repricing Patterns **	Yes	
Product Profiles **	Yes	
Time Buckets **	Yes	
ALM Assumption Specification		
Product Characteristics		Yes
Discount Methods		Yes
Prepayments		Yes
Prepayment Models		Yes
Rate Dependency Patterns		Yes
Forecast Rate Scenarios		Yes
Forecast Balances		Yes
Transaction Strategies		Yes
Maturity Mix		Yes
Pricing Margin		Yes
Transfer Pricing Rules		Yes
TP Adjustments		Yes
Stochastic Rate Indexing		Yes
ALM Processing		
Static Deterministic Process		Yes
Static Stochastic Process		Yes
Dynamic Deterministic Process		Yes
Dynamic Stochastic Process		Yes

Table 42-2 (Cont.) Visibility of Assumption rules across the supported languages

Assumption Rules	Visible across all languages	Visible only in the creation language
Cash Flow Edits	Yes	

* A future release will provide visibility for many of these application object types 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.

43

Archive-Restore

This chapter describes the details of Command-line Migration.

Topics:

- [Command-line Migration](#)
- [Command-line Migration Utility](#)

43.1 Command-line Migration

Using the Command-line utility, you can migrate (export or import) ALM metadata objects to different OFSAA environments. You can specify one or more objects within an object type or multiple object types.

During the migration process, FSI_IRCS.CREATED_DATE and FSI_IRCS.CREATED_BY fields get overwritten with the migration date and the user respectively which runs the migration.

For the list of objects that can be migrated, see [List of Supported Objects in ALM Application for command-line migration utility](#) .

43.2 Command-line Migration Utility

ALM uses the same utility that is used by the OFSAA Infrastructure. For more details, see the *Migrate Objects* section in the [Oracle Financial Services Analytical Applications Infrastructure User Guide](#).

43.2.1 Supported Objects

[List of Supported Objects in ALM Application for command-line migration utility](#) describes each of the Asset Liability Management Preference objects.

Table 43-1 List of Supported Objects in ALM Application for command-line migration utility

Object Name	Object Type ID	Support for wildcard Select all option	Support for implicit Dependency	Object Code	Remarks
Application Preferences	201	No	No	CONFIG	The entire data set is exported and replaced in the target. No validation and its dependency objects are not handled.

Table 43-1 (Cont.) List of Supported Objects in ALM Application for command-line migration utility

Object Name	Object Type ID	Support for wildcard Select all option	Support for implicit Dependency	Object Code	Remarks
Holiday Calendar	815	Yes	Yes	ser defined unique code	
Interest Rates	801	Yes	Yes	ser defined unique code	Historical rates from FSI_IR-CRATE_HIS_T table are not migrated.
Currency rates	803	No	No		Currency rates are not supported.
Currencies	802	Yes	No	User defined currency code	
Economic Indicator	804	Yes	Yes	system generated code	FSI_ECONOMIC_COST_HIST are not migrated.
Filter	1	No	Yes	System generated code	
Expression	14	No	Yes	System generated code	
Time Bucket	805	Yes	No	System generated code	
Payment patterns	809	Yes	Yes	User defined unique code	
Repricing Patterns	808	Yes	Yes	User defined unique code	
Behavior Patterns	807	Yes	Yes	User defined unique code	
Behavior Pattern Rule	314	Yes	Yes	System generated code	
Product Profiles	806	Yes	es		
Transfer Pricing Rules	200	Yes	Yes (Except MAP objects)	System generated code	If Conditional Assumption uses MAP objects, then they should be explicitly migrated using Archive restore.

Table 43-1 (Cont.) List of Supported Objects in ALM Application for command-line migration utility

Object Name	Object Type ID	Support for wildcard Select all option	Support for implicit Dependency	Object Code	Remarks
Adjustment Rules	401	Yes	Yes (Except MAP objects)	System generated code	If Conditional Assumption uses MAP objects, then they should be explicitly migrated using Archive restore.
Prepayment Rules	300	Yes	Yes	System generated code	
Prepayment Models	312	Yes	Yes	System generated code	
Stochastic Rate Index Rules	315	Yes	Yes	System generated code	
Product Characteristics	309	Yes	Yes	System generated code	
Discount Method	301	Yes	Yes	system generated code	
Forecast Rate Scenarios	305	Yes	Yes	System generated code	
Rate Dependency Patterns	612	Yes	yes	System generated code	
Forecast Balance Rules	307	Yes	yes	System generated code	
Maturity Mix Rules	302	Yes	Yes	System generated code	
Pricing Margin Rules	303	Yes	Yes	System generated code	
Transaction Strategies	306	Yes	Yes	System generated code	
Formula Result Rules	313	Yes	Yes	System generated code	
ALM Static Deterministic Process	205	Yes	Yes	System generated code	
ALM Static Stochastic Process	206	Yes	Yes	System generated code	
ALM Dynamic Deterministic Process	207	Yes	Yes	System generated code	
ALM Dynamic Stochastic Process	208	Yes	Yes	System generated code	



Note:

The following is the list of Desupported Objects in Archive-Restore:

Hierarchy Attribute

The Object must be explicitly exported before migrating any rule which uses Currencies.

43.2.2 Input Values for OBJECTMIGRATION.xml

[List of Input Attributes of OBJECTMIGRATION.XML](#) file shows the list of Input Attributes of OBJECTMIGRATION.XML file.

Table 43-2 List of Input Attributes of OBJECTMIGRATION.XML file

Object Name	Object Type Id	Input value in OBJECTMIGRATION.XML for the wildcard	Input value in OBJECT_MIGRATION.xml for Object Code
Application Preferences	201	<OBJECT Code="CONFIG" Type="201"/>	<OBJECT Code="CONFIG" Type="201"/>
Interest Rates	801	<OBJECT Code="*" Type="801"/>	<OBJECT Code="User defined unique code" Type="801"/>
Currency Rates	803	<OBJECT Code="*" Type="803"/>	<OBJECT Code="System generated code" Type="803"/>
Currencies	802	<OBJECT Code="*" Type="802"/>	<OBJECT Code="User defined unique code" Type="802"/>
Economic Indicator	804	<OBJECT Code="*" Type="804"/>	<OBJECT Code="System generated code" Type="804"/>
Filter	1	<OBJECT Code="*" Type="1"/>	<OBJECT Code="System generated code" Type="1"/>
Expression	14	<OBJECT Code="*" Type="14"/>	<OBJECT Code="System generated code" Type="14"/>

Table 43-2 (Cont.) List of Input Attributes of OBJECTMIGRATION.XML file

Object Name	Object Type Id	Input value in OBJECTMIGRATION.XML for the wildcard	Input value in OBJECT_MIGRATION.xml for Object Code
Time Bucket	805	<OBJECT Code="*" Type="805"/>	<OBJECT Code="System generated code" Type="805"/>
Payment Patterns	809	<OBJECT Code="*" Type="809"/>	<OBJECT Code="User defined unique code" Type="809"/>
Repricing Patterns	808	<OBJECT Code="*" Type="808"/>	<OBJECT Code="User defined unique code" Type="808"/>
Behavior Patterns	807	<OBJECT Code="*" Type="807"/>	<OBJECT Code="User defined unique code" Type="807"/>
Product Profiles	806	<OBJECT Code="*" Type="806"/>	<OBJECT Code="System generated code" Type="806"/>
Transfer Price Rules	200	<OBJECT Code="*" Type="200"/>	<OBJECT Code="System generated code" Type="200"/>
Adjustment Rules	401	<OBJECT Code="*" Type="401"/>	<OBJECT Code="System generated code" Type="401"/>
Prepayment Rules	300	<OBJECT Code="*" Type="300"/>	<OBJECT Code="System generated code" Type="300"/>
Prepayment Models	312	<OBJECT Code="*" Type="312"/>	<OBJECT Code="System generated code" Type="312"/>
Stochastic Rate Index Rules	315	<OBJECT Code="*" Type="315"/>	<OBJECT Code="System generated code" Type="315"/>
Product Characteristics	309	<OBJECT Code="*" Type="309"/>	<OBJECT Code="System generated code" Type="309"/>

Table 43-2 (Cont.) List of Input Attributes of OBJECTMIGRATION.XML file

Object Name	Object Type Id	Input value in OBJECTMIGRATION.XML for the wildcard	Input value in OBJECT_MIGRATION.xml for Object Code
Discount Method	301	<OBJECT Code="*" Type="301"/>	<OBJECT Code="System generated code" Type="301"/>
Forecast Rate Scenarios	305	<OBJECT Code="*" Type="305"/>	<OBJECT Code="System generated code" Type="305"/>
Rate Dependency Patterns	612	<OBJECT Code="*" Type="612"/>	<OBJECT Code="System generated code" Type="612"/>
Forecast Balance Rules	307	<OBJECT Code="*" Type="307"/>	<OBJECT Code="System generated code" Type="307"/>
Maturity Mix Rules	302	<OBJECT Code="*" Type="302"/>	<OBJECT Code="System generated code" Type="302"/>
Pricing Margin Rules	303	<OBJECT Code="*" Type="303"/>	<OBJECT Code="System generated code" Type="303"/>
Transaction Strategies	306	<OBJECT Code="*" Type="306"/>	<OBJECT Code="System generated code" Type="306"/>
Formula Result Rules	313	<OBJECT Code="*" Type="313"/>	<OBJECT Code="System generated code" Type="313"/>
ALM Static Deterministic Process	205	<OBJECT Code="*" Type="205"/>	<OBJECT Code="System generated code" Type="205"/>
ALM Static Stochastic Process	206	<OBJECT Code="*" Type="206"/>	<OBJECT Code="System generated code" Type="206"/>
ALM Dynamic Deterministic Process	207	<OBJECT Code="*" Type="207"/>	<OBJECT Code="System generated code" Type="207"/>

Table 43-2 (Cont.) List of Input Attributes of OBJECTMIGRATION.XML file

Object Name	Object Type Id	Input value in OBJECTMIGRATION.XML for the wildcard	Input value in OBJECT_MIGRATION.xml for Object Code
ALM Dynamic Stochastic Process	208	<OBJECT Code="*" Type="208"/>	<OBJECT Code="System generated code" Type="208"/>

Logging Details

1. `$FIC_HOME /utility/Migration/logs/offline_migration.log`
2. `<War_deployed_location>/logs /FUSIONSUBSYSTEMService.log`

Interest Rate Risk in the Banking Book (IRRBB)

This appendix gives you information on functionalities in ALM for Interest Rate Risk in the Banking Book (IRRBB) regulation.

IRRBB refers to the current or prospective risk to the bank's capital and earnings arising from adverse movements in interest rates that affect the bank's banking book positions. When interest rates change, the present value and timing of future cash flows change. This in turn changes the underlying value of a bank's assets, liabilities, and off-balance sheet items and hence its economic value. Changes in interest rates also affect a bank's earnings by altering interest rate sensitive income and expenses, affecting its net interest income (NII). Excessive IRRBB can pose a significant threat to a bank's current capital base and/or future earnings if not managed appropriately.

Basel Committee on Banking Supervision (BCBS) has prescribed 12 updated principles to banks to manage IRRBB.

The following three main sub-types of IRRBB are defined for these Principles:

1. Gap risk arises from the term structure of banking book instruments, and describes the risk arising from the timing of instruments' rate changes. The extent of gap risk depends on whether changes to the term structure of interest rates occur consistently across the yield curve (parallel risk) or differentially by period (non-parallel risk).
2. Basis risk describes the impact of relative changes in interest rates for financial instruments that have similar tenors but are priced using different interest rate indices.
3. Option risk arises from option derivative positions or from optional elements embedded in a bank's assets, liabilities, and/or off-balance sheet items, where the bank or its customer can alter the level and timing of their cash flows. Option risk can be further characterized into automatic option risk and behavioral option risk.

All three sub-types of IRRBB potentially change the price/value or earnings/costs of interest-rate-sensitive assets, liabilities, and/or off-balance sheet items in a way, or at a time, that can adversely affect a bank's financial condition.

BCBS has proposed a standardized approach that supervisor could mandate their banks to follow or a bank could choose to adopt it. The following functionalities have been added to ALM to meet the standardized approach requirements and also enable banks to adopt the advanced approach.

Approach

IRRBB approach in OFS ALM are explained below following sections.

- Amenability Category
- Retail/Wholesale and Transactional Non-Maturing Deposits
- Option Valuation
- Deposit Penalty for Early Withdrawal

- Identify Intra and Inter-Company Accounts
- Behavior Pattern Loader
- Material Currency

44.1 Amenability Category

In the standardized approach, interest rate-sensitive banking book positions are allocated to one of the following categories. These categories are used to determine the slotting of cash flows:

- Amenable to standardization
- Less amenable to standardization
- Not amenable to standardization
-
-
-

ALM provides the following to meet these requirements:

- Simple seeded Product Amenability Category dimension.
- The Amenability Category attribute of product dimension is populated in processing (FSI_D) tables for each account so that it can be used in the data filter and conditional assumption.

44.2 Retail/Wholesale and Transactional Non-Maturing Deposits

In the standardized approach non-maturing deposits (NMDs) must be segmented into retail and wholesale categories:

- Wholesale:
Deposits from legal entities, sole proprietorships, or partnerships are captured in wholesale deposit categories.
- Retail:
Retail deposits are defined as deposits placed with a bank by a person.
Deposits made by small business customers and managed as retail exposures are considered as having similar interest rate risk characteristics to retail accounts. These are treated as retail deposits (provided the total aggregated liabilities raised from one small business customer is less than 1 million).

Retail Non-maturing deposits can be further classified into the following categories:

- Transactional:
Retail deposits are considered as held in a transactional account when regular transactions are carried out in that account (such as, when salaries are regularly credited) or when the deposit is non-interest bearing.
- Non-transactional:
Other retail deposits are considered as held in a non-transactional account.

ALM provides the following to meet these requirements:

- Simple Customer Type dimension and attribute.
- The Retail-Wholesale Flag and Transactional Account Flag attributes for checking and savings account (CASA) and ALM account summary:
 - Retail-Wholesale Flag has two values:
R = Retail
W = Wholesale
 - Transactional Account Flag has two values:
Y = Transactional
N = Non transactional

These attributes can be used in conditional assumptions and data filters.

44.3 Option Valuation

This is used to calculate the Market Valuation (MV) for certain embedded and stand-alone (bare) options. Supported embedded options are Calls, Puts, Caps (caplets), and Floors (floorlets). This option will be enabled only if Market Value, YTM, Duration, DV01/PV01 option is also selected.

44.4 Deposit Penalty for Early Withdrawal

Term deposits may be subject to the risk of early withdrawal, also called early redemption risk. To assess this risk and take appropriate action you must be able to identify term deposits where the depositor has no legal right to withdraw before maturity. If the depositor can legally withdraw before maturity then you must be able to identify that so early withdrawals are not resulting in a significant financial loss to the depositor. Penalties normally do not reflect such an economic calculation but instead are mostly based on a simpler formula such as a percentage of accrued interest. In such cases, there is potential for changes to profit or loss arising from differences between the penalty charged and the actual economic cost of early withdrawal. It is not possible to have a standard number that would mean **significant financial loss**. It is left to the bank to decide what is significant or insignificant..

To address this, the following attributes are available in the FSI_D_TERM_DEPOSITS and FCT_COMMON_ACCOUNT_SUMMARY tables:

- Early redemption permitted flag: This indicates whether the customer as the legal right to withdraw term deposit before maturity or not. This will have two values:
 - Y = Early redemption is permitted
 - N = Early redemption is not permitted
- Significant early withdrawal penalty flag: This indicates whether early withdrawal leads to significant financial loss to customer or not. This will have two values:
 - Y = Significant penalty
 - N = Non-significant or no penalty

44.5 Identify Intra and Inter-Company Accounts

IRRBB framework applies to large internationally active banks on a consolidated basis. To enable banks to identify internal and external contracts for consolidation purpose, ALM provides logic to classify each contract into the following categories based on legal entity and customer:

- Intra: If the customer is part of legal entity hierarchy and is a child or descendent of legal entity of account.
- Inter-company: If the customer is part of legal entity hierarchy and is not a child or descendent of legal entity of account.
- External: All other contracts.

A simple dimension Customer Affiliate Category is available, which has the following three seeded values:

- EXTERNAL
- INTRACO
- INTERCO

The Customer Affiliate Category attribute is available in all instrument tables (FSI_D) and FCT_ALM_ACCOUNT_SUMMARY tables. These tables have values 1, 2, or 3 and will be populated by T2T when data moves from staging to processing. The attribute can be used in conditional assumption and data filter wherever applicable in the application.

The Customer ID attribute in Legal Entity (LE) Dimension is used to identify the customer ID of a legal entity that is used to book contracts in the source system.

44.6 Behavior Pattern Loader

The Behavior Pattern Loader allows you to enable automatic load of behavior patterns into ALM, which moves the data from model output to ALM. This is required to distinguish between the stable and the non-stable parts of each non maturing deposit category.

For more information, see the *Behavior Pattern Loader* section in the [Data Model Utilities guide](#).

44.7 Material Currency

In the standardized approach, the loss in the economic value of equity is calculated for each currency with material exposures. Material exposure is defined as accounting for more than 5% of either banking book assets or liabilities."

ALM provides the following to meet this requirement:

1. Identify Banking Book assets and liabilities: For this, the Book Type Indicator attribute is provided in all instrument tables (FSI_D) and FCT_ALM_ACCOUNT_SUMMARY to identify the banking book asset and liability. This attribute has the following three values and will be populated by T2T when data moves from stage to processing:

- 'B' for banking book
- 'T' for trading book
- 'O' for others

This attribute can be used in conditional assumption and data filter wherever applicable in ALM.

The attribute is also available in aggregate tables used by the stratification engine.

2. Aggregate Banking Book assets and liabilities for each legal entity.
3. Aggregate Banking Book assets and liabilities for each legal entity and currency.
4. Calculate the ratio of numbers obtained in steps 2 and 3. For more details, see the below flowchart. If the ratio is more than 5%, then that currency is marked as 'currency with material exposure' for that legal entity.

Perform this calculation for each As of Date.

Flowchart

Products with following account types are considered as asset:

- Earning Asset (100)
- Other Asset (200)
- Off-balance Sheet (800) and leg type is 'receivable' (2)
- Off-balance Sheet Receivable (110)

Products with the following account types are considered as liability:

- Interest bearing liabilities (300)
- Other Liabilities (400)
- Off-balance Sheet (800) and leg type is 'payable' (1)
- Off-balance Sheet Payable (310)

Common Utilities and Scripts

This chapter describes the details of common utilities and scripts.

RMIPC.SH Script

The `rmipc.sh` script file is a utility that cleans up shared memory segments and semaphores for a given UNIX User ID. This file is 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, ALM, FTP, PFT) before attempting to remove any shared memory segments or semaphores. If there are any running OFSAA processes, the script does not run.

 **Note:**

The script will always consider only the first 8 characters of the User ID, while determining the list of open semaphores or shared memory arrays.

If you are using AIX platforms, then this script will also terminate 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 terminated. Also, be careful if OFSAA and Oracle database has been installed using the same UNIX user ID 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.

Standard Navigation Paths

This section provides information to navigate through the pages referred to in this guide. Oracle Financial Services Asset Liability Management navigation paths are displayed in [List of Navigation Paths](#). Access all these pages through the ALM Administrator or ALM Analyst responsibility.

Table 46-1 List of Navigation Paths for Oracle Financial Services Asset Liability Management Application

Page	Navigation Path
Application Preferences	Select Asset Liability Management menu and select Application Preferences
Time Buckets Home	Select Asset Liability Management menu, select ALM Maintenance, and then select Time Buckets
Time Buckets – Income Simulation Buckets	Select Asset Liability Management menu, select ALM Maintenance, and then select Time Buckets. Navigate to Income Simulation Buckets tab.
Time Buckets – Repricing Gap Buckets	Select Asset Liability Management menu, select ALM Maintenance, and then select Time Buckets. Navigate to Repricing Gap Buckets tab.
Time Buckets – Liquidity Gap Buckets	Select Asset Liability Management menu, select ALM Maintenance, and then select Time Buckets. Navigate to Liquidity Gap Buckets tab.
Product Profiles Home	Select Asset Liability Management menu, select ALM Maintenance, and then select Product Profiles
Behavior Pattern Home	Select Asset Liability Management menu, select ALM Maintenance , and then select Patterns. Navigate to Behavior Patterns.
Payment Pattern Home	Select Asset Liability Management menu, select ALM Maintenance , and then select Patterns. Navigate to Payment Patterns .
Repricing Pattern Home	Select Asset Liability Management menu, select ALM Maintenance , and then select Patterns. Navigate to Repricing Patterns.
Interest Rate Code Home	Select Common Object Maintenance, select Rate Management, and then select Interest Rates.
Currency Rates Home	Select Common Object Maintenance, select Rate Management, and then select Currency Rates
Currencies Home	Select Common Object Maintenance, select Rate Management, and then select Currencies.

Table 46-1 (Cont.) List of Navigation Paths for Oracle Financial Services Asset Liability Management Application

Page	Navigation Path
Economic Indicators Home	Select Common Object Maintenance, select Rate Management, and then select Economic Indicators
Product Characteristics Home	Select Asset Liability Management menu and select Product Characteristics
Discount Methods Home	Select Asset Liability Management menu and select Discount Methods
Prepayment Rule Home	Select Asset Liability Management menu and select Prepayments
Prepayment Models Home	Select Asset Liability Management menu and select Prepayment Models
Transfer Pricing Rules	Select Asset Liability Management menu, select Forecast Assumptions, and then select Transfer Pricing Rules
TP Adjustments	Select Asset Liability Management menu, select ALM Assumption Specification, and then select Forecast Assumptions. Select TP Adjustments
Forecast Rates	Select Asset Liability Management menu, select ALM Assumption Specification, and then select Forecast Rates
Rate Dependency Patterns Home	Select Asset Liability Management menu, select ALM Assumption Specification, and then select Forecast Assumptions. Select Rate Dependency Patterns
Forecast Balances Home	Select Asset Liability Management menu and select ALM Assumption Specification, select Forecast Assumptions, and then select Forecast Balances
Maturity Mix Home	Select Asset Liability Management menu, select ALM Assumption Specification, and then select Forecast Assumptions. Select Maturity Mix
Pricing Margins Home	Select Asset Liability Management menu, select ALM Assumption Specification, and then select Forecast Assumptions . Select Pricing Margins
Transaction Strategies Home	Select Asset Liability Management menu, select ALM Assumption Specification, and then select Transaction Strategies
Formula Results Home	Select Asset Liability Management menu, select ALM Assumption Specification, and then select Formula Results
Stochastic Rate Indexing Home	Select Asset Liability Management menu, select Assumption Specification, and then select Stochastic Rate Indexing

Table 46-1 (Cont.) List of Navigation Paths for Oracle Financial Services Asset Liability Management Application

Page	Navigation Path
Static Deterministic Process Home	Select Asset Liability Management menu, select ALM Processing, and then select Static Process . Select Deterministic
Static Stochastic Process Home	Select Asset Liability Management menu, select ALM Processing , and then select Static Process. Select Stochastic/Historical Simulation
Dynamic Deterministic Process Home	Select Asset Liability Management menu, select ALM Processing and then select Dynamic Process. Select Deterministic
Dynamic Stochastic Process Home	Select Asset Liability Management menu, select ALM Processing, and then select Dynamic Process . Select Stochastic/Historical Simulation
Cash Flow Edits Process	Select Asset Liability Management menu, select ALM Processing and then select Cash Flow Edits
Metadata Browser	Select Asset Liability Management menu and select Metadata Browser

Oracle ALM Error Messages

This chapter describes about the ALM Error Messages.

Table 47-1 List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
<Assumption rule type> in Oracle ALM Process Rule <Assumption rule name> not found in database	Assumption Rule cannot be found in the database.	105	If rule is critical for processing, 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 Organizational Unit dimension if two-dimension output processing is defined.	120	Processing is stopped.
No of Buckets mismatch Time Bucket in <Assumption Rule>	Assumption Rule was created when the active Time Bucket Rule held more/less buckets than it has currently; therefore, the Assumption Rule contains more/less bucket information than necessary.	325	If Assumption Rule holds more buckets than what currently exists, only the buckets within the current modeling term will be used. If Assumption Rule holds less buckets than what currently exists, the assumption for the last bucket will be carried forward for the remainder of the modeling term.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
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 same as bucket start date.	326	New Business timing is defaulted to 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	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 for this bucket.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
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 member 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 ALM will assume an amortization code of 700
Invalid record: Maturity Date in the past leaf member: <leaf number>	Maturity Date is less than the as of date	345	Record is not processed.
Invalid record: Remaining number of payments <= 0 leaf member: <leaf number>	Remaining number of payments is less than or equal to zero.	345	Record is not processed.
Invalid record: Pmt Freq = 0 leaf member: <leaf number>	Payment frequency is equal to zero on an amortizing instrument.	345	Record is not processed.
Invalid record: AmrtTerm < OrgTerm on amortizing instrument leaf member: <leaf number>	Amortization term is less than original term for amortizing instrument.	345	Re-amortization of payment will be affected.
Invalid record: Next payment date in the past leaf member: <leaf number>	Next payment date is less than the as of date.	345	If 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 ALM 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 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 first repricing date.
Invalid record: Valid rate floor > current rate leaf member: <leaf number>	Rate Floor is not equal to zero and it is greater than the current rate.	345	Rate floor will be imposed on first repricing date.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
Invalid record: Next repricing date in the past on repricing instrument leaf member: <leaf number>	Repricing frequency is not equal to zero and next repricing date is less than the as of date.	345	If the next repricing date is very far in 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	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 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 amortization type code.
Invalid record: No of Events>16000	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.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
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>	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>	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.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
Interest in Advance is not supported for multiple reprice instruments. Hence defaulted to Interest in Arrears. Leaf <leaf number>	Multiple Reprice events with interest payment in advance.	345	Logs an error, continues execution.
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 when compounding frequency is set as Continuous (170). The compounding is defaulted to None. Leaf <leaf number>	For Multiple Reprice Instruments with Compounding Basis Code set as 170.	345	Logs an error, continues execution. Note: This error condition occur from ALM 8.1.1.1.0 release onwards.
For Multiple reprice instruments where compounding frequency <> repricing 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 Trate is not supplied in the instrument	345	Logs an error, continues execution.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
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. Instrument is processed without Inflation adjustment.	345	Logs an error, continues execution.
Index Adjustment Type is <> Not Applicable, and Amortization code is other than 100, 500, 700, 800, 801, 802, 820. Instrument processed without Inflation adjustment.	When Index Adjustment Type is <> Not Applicable, and Amortization code <> 100, 500, 700, 800, 801, 802, 820. Instrument processed without Inflation adjustment.	345	Logs an error, continues execution.
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.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
Payment date does not have Index value in Account Index History table. Index Factor of 1 will be considered on those payment dates.	When 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	Assumption Rule was created when the active Time Bucket Rule held more/less buckets than it has currently; therefore, the Assumption Rule contains more/less bucket information than necessary.	350	If Assumption Rule holds more buckets than what currently exists, only the buckets within the current modeling term will be used. If Assumption Rule holds less 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 autobalancing leaf member.	360	Targeting methods cannot be used for leaves specified as roll-into or autobalancing. The targeted balances will be ignored.
Res_det: Security violation	Current user does not have rights to create an Oracle ALM results table.	365	Processing is stopped.
Res_det: Truncate fail	Results table for 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 struture 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.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
No. of scen in results > expected leaf member: <leaf number>	Number of scenarios in results set is greater than number of scenarios expected from querying the current Forecast Rates Assumption Rule while processing Autobalancing.	380	Autobalancing will only be processed for the scenarios included in the current Forecast Rates Assumption Rule.
Invalid interest type - defaulted to interest in arrears	Interest type code is not equal to 0 or 1.	385	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 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 instrument is defaulted to simple interest.
Formula Results Error: Mismatch in buckets number	The number of modeling buckets in result set does not match the number of modeling buckets defined in Formula Results.	397	Error is logged.
Invalid Exchange Rate Range Error	Exchange Rate Range Error <Currency>	400	Error is logged
Invalid Exchange Rate Error	Exchange Rate for [From Currency To Currency] = 0 for <Date>	402	Error is logged
Invalid Currency Gain/Loss Basis.	Invalid Currency Gain/Loss Basis. Defaulted to "Temporal" when values are missing in Product characteristics.	406	Instrument defaulted to "Temporal" in Product Characteristics
Invalid Pay-Equivalent Compounding Convention	Invalid Pay-Equivalent Compounding Convention. Defaulted to "Do Not Adjust" when values are missing in Product characteristics.	407	Instrument defaulted to "Do Not Adjust" in Product Characteristics

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
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 interest rate code on 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 which is less than the As of Date. Instrument will reprice to the rate as of the As of Date.
Last point used	Reprice date occurs beyond 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. Instrument will reprice to the rate as of the last forecasted date.
Code found only	Interest rate code exists in 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.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
ast payment date is before origination date.	The last payment date from instrument record is prior to the origination date on the instrument record.	545	Logs error and continues. For Transaction Strategy, last reprice date is set to origination date.
No reprice frequency for adjustable record.	Instrument is coded as adjustable, but the reprice frequency is equal to zero.	550	Instrument will be treated as 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 for the documented amortization type code.	560	Log error and default to simple interest.
No pattern information found for record.	Documented amortization type code exists in 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 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.	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.	n unknown Amortization Type Code was used.	585	Instrument will be defaulted to simple interest.
No Repricing Pattern found for record.	An unknown Adjustable Type Code was used.	600	Instrument will be defaulted to Other Adjustable.
Invalid Event_Det_Seq (Adj_Type_CD:<Adjustable type code>); Evnt_dtl_seq should start from 0.	or an Event Sequence, Event Detail Sequence has started from a non-zero value.	635	Repricing pattern is ignored and will produce erratic results if this repricing pattern is used.

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
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 which is less than the As of Date. Instrument will reprice to the rate as of the As of Date.
Last point used.	Reprice date occurs beyond 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. Instrument will reprice to the rate as of the last forecasted date.
Negative Transfer Rate.		740	
Invalid duration generated for this row.		795	
Divide by zero		810	
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 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 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 value of column MARKET_VALUE_CLEAN_C is beyond specified precision, then MARKET_VALUE_C value is considered for calculation (less than 9999.999999). If value of MARKET_VALUE_C is also beyond specified precision, then Engine will default this value to 100.	345	

Table 47-1 (Cont.) List of ALM Error Messages

Error Message	Error Condition	Error Code	Effect of Error on Processing
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 value of columns MARKET_VALUE_C and MARKET_VALUE_CLEAN_C are beyond specified precision, Engine will default these values to 100.	345	

Glossary

Topics:

- [List of Glossary](#)

48.1 List of Glossary

Aggregation

To summarize detailed instruments to a table in the database which can be used for faster processing in ALM.

Answers

Answers is the OBIEE (Oracle Business Intelligence Enterprise Edition), ad-hoc reporting tool.

As of Date

Date at which the data is current

Asset/Liability Management Committee

The Asset/Liability Management Committee (or ALCO) is an organization within a financial institution whose charter is to manage interest rate and liquidity risk.

At-Risk Period

The time horizon for Value-at-Risk, such as the difference between the time in the future when we evaluate a portfolio loss and the As of Date.

Base Rates

Section in Oracle Asset Liability Management that stores the interest rates associated with the data As-of-Date.

Basis Points

1/100th of a percent (abbreviated as "bps")

Cash Flow Instrument Table

An instrument table that contains all of the OFSAA cash flow columns required by the cash flow engine.

Cash Flow Column

Column in an instrument table used by the OFSAA cash flow engine to perform cash flow analysis on a record.

CPR

Constant Prepayment Rate (CPR) is a measure of an annualized prepayment rate.

Credit Risk

The risk that a loan holder will be unable to repay any portion of the loan.

Current Rate Risk Profit

Component of funding center rate risk results attributed to current mismatches of assets and liabilities.

Data Filter Rule

Data Filters are used to define which data should go into a processing run.

Data Input Helper

A pop-up dialogue that facilitates the definition of a series of input values (dates or numbers) by allowing several methods for defining structured patterns in the data.

DDA

Demand Deposit Account. An example of a DDA is a checking account.

De-annualize

To compute the monthly equivalent rate of an annual rate.

Duration

Duration is the rate of market value change with respect to discount rate changes. It is a measure of market value sensitivity: the lower the value, the less sensitive the market value to changes in interest rates.

Embedded Rate Risk Profit

Portion of funding center rate risk result attributed to prior rate bets.

Funding Center

Area in a financial institution that receives the transfer pricing charge and credit for funds.

Funds Transfer Pricing

A method for valuing all sources and uses of funds for a balance sheet.

General Ledger

The main data source that defines an institution's financial reality. The General Ledger reflects all accounting entries.

Grid

A logical grouping of cells often surrounded by scroll bars.

Hierarchy

Hierarchical structure for dimension members in OFS applications (Examples: organizational and product type)

Historical Rates Table

OFSA repository for all historical actual interest rates.

Instrument

Synonymous with an account record or an individual contract.

Instrument Table

A type of table contained in the OFSAA database used to store account level information

Instrument Records

Rows in the OFSAA database that carry transaction account level information (Example: deposit account by deposit account)

Interest Rate Code

User defined code to reference a yield curve or single rate index for historical analysis, transfer pricing, and interest rate forecasting purposes.

Last Repricing Date

Date the rate last changed for an adjustable rate instrument and the origination date for a fixed rate instrument.

Leaf Fields

OFSAA database fields used to define hierarchical segmentations of data. They also draw a relationship between the instrument data and the General Ledger data in Ledger/Stat. Also known as key dimensions

Leaf Values

Specific numeric values that make up the Leaf Fields. These are dimension members that can never be used as parent nodes on a hierarchy. The fact data should always be populated with dimension member - leaf values only.

Ledger Stat

Table in the OFSAA database that stores all General Ledger as well as statistical information for current and historical periods.

Liquidity Premiums

A charge levied on a long-term instrument to compensate for illiquidity of the funds.

Log in

To access the programs and database of any OFSAA application by providing a valid user name and password.

Long Run Rate

One of the user-input parameters of the Vasicek (discrete-time) term structure model; represents the equilibrium value of the one-month annually compounded rate.

Market Price of Risk

In financial economics theory the market price of risk is a measure of inter-temporal risk-aversion of the aggregate investor; for example, a high market price of risk during some future period means that investors will be more risk-averse, and that rates for that term should be higher to compensate for this risk; in practical terms, the market price of risk is the "plug" that makes the risk-neutral rates price risk-free bonds correctly.

Market Value

In Monte Carlo, average of the (scenario specific) present values. In deterministic processing, it is the present value of the cash flows of the specific scenario.

Matched Rate Transfer Pricing

Method of Transfer Pricing where all accounts have transfer rates that reflect their specific maturity and repricing characteristics.

Matched Spread

The interest profit margin for any account, measured as the Note Rate minus the Transfer Rate for asset accounts and the Transfer Rate minus the Note Rate for Liability and Equity accounts.

Monthly Rate

Yield on a loan contracted at the beginning of a month for a period of one month assuming a continuous compounding basis; the monthly rate is a function of time and scenario; the Rate Generator also computes rates for a different term than a month.

Next Repricing Term

Repricing frequency for an adjustable rate instrument and the original term to maturity for a fixed rate instrument.

Oracle Asset Liability Management

ALM is an Asset/Liability management simulation tool that generates daily cash flows for each individual transaction record and allows users to model their balance sheet using both deterministic and stochastic methods.

Oracle Business Intelligence Enterprise Edition

OBIEE is Oracle's market leading business intelligence product. OFSAA applications are fully integrated with OBIEE through the OFSAA BI applications, including Oracle Financial Services Asset Liability Management Analytics and Oracle Financial Services Profitability Analytics.

Oracle Financial Services Balance Sheet Planning

Balance Sheet Planning performs distributed budgeting of all balance sheet and income statement accounts.

Oracle Financial Services Funds Transfer Pricing

Funds Transfer Pricing performs Matched Rate Transfer Pricing for an entire balance sheet.

Oracle Financial Services Pricing Management – Transfer Pricing Component

Pricing Management allows users to call the Transfer Pricing engine in real time, providing the line bankers with on-demand information to support deal pricing.

Oracle Financial Services Profitability Management

Profitability Management assists customers in developing multiple levels of profitability (Example: organizational, product, customer, account profitability).

Oracle Financial Services Analytical Applications Infrastructure

OFSAAI is a set of powerful administrative tools that provide management of the OFSAA environment and access to the database by OFS application users. The Infrastructure is a required component for all OFSAA applications with the exception of Balance Sheet Planning.

Oracle Financial Services Advanced Analytical Applications Infrastructure

The advanced infrastructure provides the modeling framework and stress testing framework as additional complimentary components to supplement to core analytic applications.

Operating Cost

Non-interest related cost of running a business.

Option Costs

Costs assigned to measure the value of any customer option on an instrument.(Example: prepayments on mortgage loans). These costs are typically added to the base transfer rate to compute an all-in funding rate.

Portfolio Fields

Fields in the OFSAA database that are common to multiple instrument tables. The OFSAA Administrator determines the portfolio fields.

Prepayment

A reduction in the principal balance of a transaction record prior to the contracted schedule date.

Present Value

In Monte Carlo, sum of cash flows paid by a security along a particular rate scenario, discounted by the stochastic discount factor. In deterministic processing, the sum of the cash flows discounted by the deterministic discount factor.

PSA

A prepayment specification method established by the Public Securities Association, which relates the CPR to the age of that instrument.

Reconciliation

The process of comparing information from one data source to another.

Record

Usually a single account or transaction, or aggregation of accounts, stored in the database (also called a row).

Reporting Currency

An active currency to which balances in other currencies are consolidated, often used for reporting.

Single Rate

An interest rate code with only one point defined (Examples: prime rate and 11th District Cost of Funds Index).

Speed of Mean Reversion

One of the user-input parameters of the Vasicek and Extended Vasicek (discrete time) term structure models; represents the long-run drift factor.

SQL

Structured Query Language. A direct method of accessing the raw OFSAA database.

Stochastic Discount Factor

Present value (along a rate scenario) of one dollar received at some future time; it is a function of future time, OAS, and scenario.

Transfer Pricing Rule

An OFSAA Rule used to specify the method for transfer pricing each balance sheet account.

Volatility

One of the user-input term parameters of all (discrete-time) term structure models; represents a standard deviation of the one-month annually compounded rate.

Yield Curve

Term structure of annually compounded zero-coupon bond yield, as recorded in Rate Management > Historical Rates.

Glossary

Index