Derivatives Service Bureau

Validation, Normalization and Derivation

UPI Product Definitions

Version 5

CHANGE HISTORY

Date	Status	Version	Revision Details
5 Aug 2022	Draft	1	Initial Version
15 Nov 2022	Draft	2	• Update Underlier ID Validation, Normalization and Appendix Sections • Add Derivation Section and Underlier ID Source Selection to support Alternative Underlier ID
07 Feb 2023	Draft	3	• Update Product Derivation Section to include Underlier Name Derivation Rules
01 Mar 2023	Draft	4	• Update Product Normalization and Derivation Sections for Underlier Characteristic attribute • Add validation rule for Underlier ID Source (LEI) that accepts 'OTHER' as a valid input value
20 Apr 2023	Draft	5	• Change of Document Title to include Derivation

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1 INTRODUCTION

This document provides the user with the validation and normalization rules where applicable based on the product definition for UPI Service.

1.1 Associated Documentation

Each section links to reference documents where values will be maintained for the sake of consistency and ease of access e.g., Enumerations, Data Dictionary.

These documents are made available for references as follows:

- UPI Enumerations Document can be found in the Enumerations section on the DSB website.
- UPI Product Definition Data Dictionary can be found in the Other Documents section on the DSB website.

	Underlier Type	Asset Class(es)	Link	Description
Underlier ID Validation				
CCY	**Currency**	**FX**	Enumeration Validation	
EQIDX	**Equity Index**	**EQ**	Enumeration Validation	
FPML	**Floating Rate Index / Inflation Rate Index**	**RT**	Enumeration Validation	
COIDX	**Commodity Index**	**CO**	Enumeration Validation	
COMM	**Commodity Ref Price**	**CO**	Enumeration Validation	
ISIN	**Single Stock, Fixed Income Security, Equity Index**	**RT, EQ, CR**	Syntactic, Prefix Validation	
RIC, CUSIP, FIGI, SEDOL	**Single Stock, Fixed Income Security, Equity Index**	**RT, EQ, CR**	Mapping Validation	
LEI	**Legal Entity**	**CR**	Syntactic Validation	
CRIDX	**Credit Index**	**CR**	Enumeration Validation	
PROP	**Proprietary Index**	**RT, CR, EQ, CO**	RDL and Classification Validation	
UPI	**Swaption Underlier**	**RT, CR, CO**	Syntactic, Classification and RDL Validation	
Other Attribute Validation				
Notional Currency / Other Notional Currency		**RT, FX**	Identical Validation	
Settlement Currency		**FX**	Classification Validation	
Reference Rate Term Value / Unit		**RT**	Numeric Validation	
Underlying Instrument Index Term Value / Unit		**RT, CR**	Numeric Validation	
Index Series and Version		**CR**	Numeric Validation	
Commodity Classification		**CO**	Classification Validation	
Product Normalization				
Underlying Instrument Index Term Value / Unit		**RT, CR, EQ, CO**	Date Normalization	
Reference Rate Term Value / Unit		**RT**	Date Normalization	
Underlying Instrument Index		**EQ**	ID Normalization	
Notional Currency / Other Notional Currency		**RT, FX**	Order Normalization	
Commodity Classification		**CO**	Order Normalization	
Underlying Structure / Underlier Characteristic		**RT, CR, EQ, CO**	Classification Normalization	
Product Derivation				
Underlier Characteristic		**CO**	Classification Derivation	
Underlier ID / Underlying Instrument ISIN		**RT, CR, EQ**	ID Derivation	
Underlier Name		**RT, CR, EQ, CO, FX**	Name Derivation	

2 UNDERLIER ID VALIDATION

2.1 Introduction

This section specifies the Underlier ID validation based on the selected Underlier Type and Underlier ID Sources.

Underlier Type	Underlier ID Source	Validation Type	Validation	Link	Error Message
Commodity Index	COIDX	Enumeration Validation	The input is validated against Commodity Index Enumerated List.	See Enumeration Document	*“Error: Underlying Instrument Index: instance value (X) not found in enum (possible values: [X])”*
Commodity Ref Price	COMM	Enumeration Validation	The input is validated against Commodity Ref Price Enumerated List.	See Enumeration Document	*“Error: Reference Rate: instance value (X) not found in enum (possible values: [X])”*
Credit Index	CRIDX	Enumeration Validation	The input is validated against Credit Index Enumerated List.	See Enumeration Document	*“Error: Underlying Instrument Index: instance value (X) not found in enum (possible values: [X])”*
Currency	CCY	Enumeration Validation	The input is validated against Currency Code Enumerated List.	See Enumeration Document	*“Error: Notional Currency: instance value (X) not found in enum (possible values: [X])”*
Equity Index Name	EQIDX	Enumeration Validation	The input is validated against Equity Index Name Enumerated List. The input Equity Index Name is translated to Equity Index ISIN if mapping exists, and Equity Index ISIN is returned as part of the UPI Record.	See Enumeration Document	*“Error: Underlying Instrument Index: instance value (X) not found in enum (possible values: [X])”*
[Commodity Index, Commodity Ref Price, Credit Index, Currency, Equity Index Name]	[COIDX, COMM, CRIDX, CCY, EQIDX]	Enumeration Validation	Where oneOf structure for Underlier Type is made available, the input is validated against the Underlier Enumerated List.	See Enumeration Document	*"/Attributes/Underlying: instance failed to match exactly one schema (matched 0 out of X)"*

Equity Index Identifier	ISIN	Syntactic, Prefix Validation	• The input ISIN must be aligned with all the following syntactic validations: ○ The input text by user must be in 12 characters. ○ 1^{st} 2 characters: alpha ○ The input text must not have a prefix of "QZ" or "EZ". ○ Next 9 characters: alphanumeric ○ Last character: check sum *(as defined in ISO 6166: 2013)* • The prefix of the input ISIN must correspond to a valid ISIN prefix that is listed in the RA list of ISIN prefixes. • User is only allowed to enter an ISIN of an Equity Index. Hence, Alternative Underlier IDs are not supported. • For Multi-asset, Equity Identifier is used as an underlier type where user is able to enter an ISIN of a Single Stock or an ISIN of an Equity Index.	N/A	*"Error: ISIN/s must be valid."*
Equity Identifier Fixed Income Security Single Stock	ISIN	Syntactic, Prefix Validation	• The input ISIN must be aligned with all the following syntactic validations: ○ The input text by user must be in 12 characters. ○ 1^{st} 2 characters: alpha ○ The input text must not have a prefix of "QZ" or "EZ". ○ Next 9 characters: alphanumeric ○ Last character: check sum *(as defined in ISO 6166: 2013)* • The prefix of the input ISIN must correspond to a valid ISIN prefix that is listed in the RA list of ISIN prefixes.	N/A	*"Error: ISIN/s must be valid."*

	[RIC, FIGI, CUSIP, SEDOL]	Mapping Validation	Where user can enter an ISIN as a Primary Underlier ID, user is also able to enter an Alternative Underlier ID based on the selected underlying asset class and underlier type. No validation applies to Underlier ID attribute when one of the following Underlier ID Source values are selected, i.e., RIC, FIGI, CUSIP, SEDOL. However, if no mapping exists in the DSB Reference Database, then the request will be rejected.	N/A	*"No Primary ID mapping is available for the input Alternative Underlier ID [X]".*
			When user tries to create a UPI using an Alternate ID source without permission, an error message will be returned and will not create a UPI.	N/A	*"No permissions to use [CUSIP|FIGI|RIC|SEDOL] as an input Underlier ID Source"*
			When user tries to retrieve/search a UPI using an Alternate ID source without permission, an error message will be returned and will not retrieve a UPI.	N/A	*"No permissions to use [CUSIP|FIGI|RIC|SEDOL] as an input ReturnUnderlier ID Source"*
Legal Entity	LEI	Syntactic Validation	• The input LEI must be aligned with the following syntactic validations: ○ 1st 18 characters: alphanumeric ○ Last 2 characters: numeric *(as defined in ISO 17442: 2012)* • This attribute can also accept the value of "OTHER" *(must be in uppercase)*.	N/A	*"Value must match the pattern ^(OTHER|[A-Z0-9]{18}[0-9]{2})$."*
Floating Rate Index	FPML	Enumeration Validation	The input is validated against Floating Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
Inflation Rate Index	FPML	Enumeration Validation	The input is validated against Inflation Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
Combined Floating Rate Index and Inflation Rate Index	FPML	Enumeration Validation	The input is validated against combined Floating Rate Index and Inflation Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*

[Floating Rate Index, Inflation Rate Index, Combined Floating Rate Index and Inflation Rate Index]	FPML	Enumeration Validation	Where oneOf structure for Underlier Type is made available, the input is validated against the Underlier Enumerated List.	See Enumeration Document	*"/Attributes/Underlying: instance failed to match exactly one schema (matched 0 out of X)"*
Proprietary Index	PROP	RDL and Classification Validation	The input PROP must exist in the DSB Proprietary Index Enumeration that are made on a per asset class and only relevant to the particular asset class based on DSB data. *Exception: DSB Proprietary Index for asset class "Other" which is applicable to all asset classes.*	See Enumeration Document	*"Error: Given Index/ices must be an existing and valid Asset Class [XXX] or Multi-Asset Index".*
UPI	UPI	Syntactic, Classification and RDL Validation	The input UPI must be aligned with all the following syntactic validations: • 1st 2 characters: alpha • Next 9 characters: alphanumeric • Last character: check sum • The input text must have a prefix of "QZ".	N/A	*"Value must match the pattern ^QZ([0-9BCDFGHJ-NPQ-TVWXZ]){10}$".*
			The input underlier UPI is not valid and does not exist in UPI RDL.		*"Error: Underlier ID [UPI] not found".*
		Specific Product Validation	Product: Rates.Option.Swaption The Underlying Instrument UPI record returned from the UPI RDL must meet the following criteria: ○ Asset Class: "Rates" ○ Instrument Type: "Swap" ○ Status: not = "Deleted"		*"Error: Underlier ID [UPI] must be a valid and existing Rates Swap".*

			Product: Credit.Option.Index_Swaption The Underlying Instrument UPI record returned from the UPI RDL must meet the following criteria: o Asset Class: “Credit” o Instrument Type: “Swap” o Product: “Index” or “Index Tranche” or “Total Return Swap” or “Non-Standard” o Underlying Asset Type: “Index” or “Index Tranche” Status: not = “Deleted”		*“Error: Underlier ID [UPI] must be a valid and existing Credit Swap”.*
			Product: Credit.Option.Single_Name_Swaption The Underlying Instrument UPI record returned from the UPI RDL must meet the following criteria: o Asset Class: “Credit” o Instrument Type: “Swap” o Product: “Corporate” or “Municipal” or “Sovereign” or “Total Return Swap” or “Loan” or “ABS” or “Non-Standard” o Underlying Asset Type: “Single Name” or “Other” o Status: not = “Deleted”		*“Error: Underlier ID [UPI] must be a valid and existing Credit Swap”.*
			Product: Commodities.Option.Swaption The Underlying Instrument UPI record returned from the UPI RDL must meet the following criteria: o Asset Class: “Commodities” o Instrument Type: “Swap” o Product: “Basis Swap” or “Multi Exotic Swap” or “Single Index” or “Swap” o Status: not = “Deleted”		*“Error: Underlier ID [UPI] must be a valid and existing Commodities Swap”.*

2.2 Basis Style Underlier ID Validation

For Underlying Asset Classes e.g., Commodities and Rates where basis style component are applicable, the following Underlying Instrument combinations will apply:

Asset Class	Underlying Structure	Underlier Type/ Underlier ID Source	Other Underlying Structure	Other Underlier Type/Other Underlier ID Source	Validation Type	Validation	Link	Error Message
Commodities	Single Underlier	Commodity Ref Price [COMM]	Single Underlier	Commodity Ref Price [COMM]	Enumeration Validation	For both legs, the input is validated against Commodity Reference Price Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
						If Underlying Structure selected is Commodity Index [COIDX] or Proprietary Index [PROP] and Other Underlying Structure selected is Commodity Ref Price [COMM] or Basket.	N/A	*"Error: Other Reference Rate/Other Underlier Characteristic [Basket] is only supported if Underlier Type selected is Commodity Ref Price"*
					Underlier Type Validation	If Underlying Structure selected is Commodity Index [COIDX] or Proprietary Index [PROP], Other Underlying Structure and its associated attributes (Other Notional Currency, Other Base Product, Other Sub Product, Other Additional Sub Product) must not be present in the REQUEST message.	N/A	*N/A*
						If Other Underlying Structure [COMM] is selected and its associated attributes (Other Base Product, Other Sub Product, Other Additional Sub Product) are not selected.	N/A	*"Must have property OtherBaseProduct"*
						If Other Underlying Structure [COMM] is not selected but its associated attributes (Other Base Product, Other Sub Product, Other Additional Sub Product) are selected.	N/A	*"Must have property OtherUnderlying"*
	Single Underlier	Commodity Ref Price [COMM]	Basket	N/A	Enumeration Validation	For first leg, the input is validated against Commodity Reference Price Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
	Basket	N/A	Single Underlier	Commodity Ref Price [COMM]	Enumeration Validation	For other leg, the input is validated against Commodity Reference Price Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
	Basket	N/A	Basket	N/A	N/A	N/A	N/A	*N/A*

Rates	Single Underlier	Floating Rate [FPML]	Single Underlier	Floating Rate [FPML]	Enumeration Validation	The input is validated against Floating Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
	Single Underlier	Floating Rate [FPML]	Single Underlier	Inflation Rate [FPML]	Enumeration Validation	The input is validated against Floating Rate Index and Inflation Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
	Single Underlier	Inflation Rate [FPML]	Single Underlier	Inflation Rate [FPML]	Enumeration Validation	The input is validated against Inflation Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
	Single Underlier	Floating Rate or Inflation Rate [FPML]	Basket	N/A	Enumeration Validation	For first leg, the input is validated against the combined Floating Rate Index and Inflation Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
	Basket	N/A	Single Underlier	Floating Rate or Inflation Rate [FPML]	Enumeration Validation	For other leg, the input is validated against the combined Floating Rate Index and Inflation Rate Index Enumerated List.	See Enumeration Document	*"Error: Reference Rate: instance value (X) not found in enum (possible values: [X])"*
	Basket	N/A	Basket	N/A	N/A	N/A	N/A	*N/A*

2.3 Underlier ID Source Selection

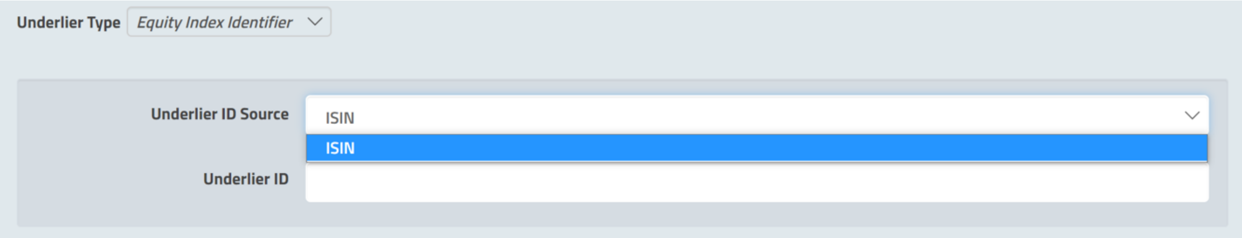
This section specifies the process where Primary and Alternative Underlier IDs are supported based on the selected product.

Based on the selected underlying asset class and underlier type of the product, the selection to support the origin of the Underlier ID is made available where;

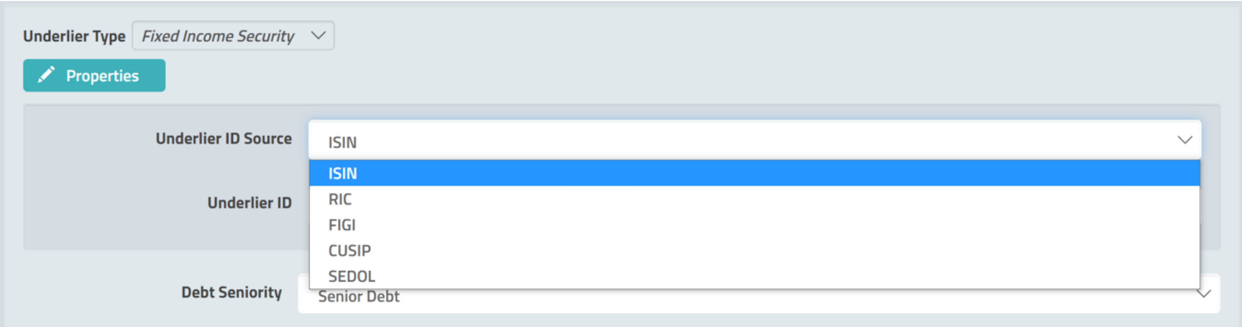
- Primary Underlier ID Source → ISIN
- Alternative Underlier ID Source(s) → [RIC; FIGI; CUSIP; SEDOL]

In cases where (a) single Underlier ID Source is supported, the field will have a default value or (b) if multiple Underlier ID Source is available, an enumeration list will be made available based on its supported product.

For example, an Equity Option Single Index where underlier type – Equity Index Identifier can only be supported by a single source, e.g., ISIN, the selection is not required, and the value for Underlier ID Source is auto-populated.



whereas for Corporate CDS where underlier type – Fixed Income Security can be supported by different Underlier ID Sources e.g., ISIN, RIC, CUSIP, FIGI, SEDOL. The selection of Underlier ID Source values is made available as enumerated list after selecting Fixed Income Security as an underlier type.



Note: Please see Appendix below for the complete list of product templates where Alternative Underlier ID Sources are supported.

3 OTHER ATTRIBUTE VALIDATION

This section specifies the validation of the required attributes based on the selected product.

Attribute	Validation Type	Validation	Error Message
Commodity Classification	Classification Validation	• The user inputs the Base Product, Sub Product and Additional Sub Product in such order. No default value set for Sub Product and Additional Sub Product. • Sub Product and Additional Sub Product enumerated list is dependent on the input Base Product with enumerated values that can be found here. If Sub Product or Additional Sub Product does not have a corresponding value, attributes(s) will be removed.	
		• If Base Product is selected and has no input value.	*"/Attributes: object has missing required properties ([\"BaseProduct\"])"*
Notional Currency / Other Notional Currency	Identical Validation	The input Notional Currency and Other Notional Currency cannot be identical. • The input Notional Currency and Other Notional Currency are both CNY and has no Place of Settlement attribute. *Exception below:* *The input Notional Currency and Other Notional Currency are both CNY and has Place of Settlement = "Hong Kong".*	*"Error: Notional Currency and Other Notional Currency cannot be identical."*
Settlement Currency	Classification Validation	Settlement Currency is a required attribute if a Place of Settlement attribute is selected. • If Settlement Currency is selected and Delivery Type is not "Cash", please see error message.	*"Error: Delivery Type must be Cash".*
	Identification Validation	• The input Notional Currency and Other Notional Currency is both CNY and Place of Settlement is not "Hong Kong".	*"Error: Place of Settlement must be Hong Kong for CNY/CNY request".*

Reference Rate Term Value / Other Leg Reference Rate Term Value	Numeric Validation	The input text must be an integer from -999 to 999 (excluding 0) with exception for multi-asset product definitions where there is more than 1 underlying rate.	
		• If the input text is less than -999.	*GUI: "Value must be at least -999."* *REST API: ""/Attributes/ReferenceRateTermValue: numeric instance is lower than the required minimum (minimum: -999, found: XXX)"*
		• If the input text is greater than 999.	*GUI: "Value must be at most 999."* *REST API:* *"/Attributes/ReferenceRateTermValue: numeric instance is greater than the required maximum (maximum: 999, found: XXX)"*
		• If the input text contains negative (-) after the integer.	*"Value must be of type integer. Value must be at most 999. Value must be at least -999."*
		• If the input text is non-numeric.	*GUI: "Value must not validate against the provided schema. Value can't be 0."* *REST API:* *"/Attributes/ReferenceRateTermValue: instance type (string) does not match any allowed primitive type (allowed: [\"integer\"])"*
		• If the input text is 0.	*"/Attributes/ReferenceRateTermValue: instance matched a schema which it should not have"*

Reference Rate Term Unit / Other Leg Reference Rate Term Unit	Enumeration Validation	This attribute is required if the selected Underlier ID Source is FPML where enumerated values are [DAYS, WEEK, MNTH, YEAR]. • If the selected Underlier ID Source is FPML and Reference Rate Term Unit has no input value.	*"Must have property ReferenceRateTermUnit"*
Underlying Instrument Index Term Value	Numeric Validation	• If the selected Underlier ID Source is CRIDX, the input text must be an integer from -999 to 999 (excluding 0) with exception for multi-asset product definitions where there is more than 1 underlying instrument index. • If the selected Underlier ID Source is PROP, the input text must be an integer from -999 to 999 (including 0).	
		• If the selected Underlier ID Source is CRIDX or PROP and Underlying Instrument Index Term Value has no input value.	*"Must have property UnderlyingInstrumentIndexTermValue"*
		• For standard product definitions, if the selected Underlier ID Source is CRIDX where the input text is equal to 0.	*"Value must not validate against the provided schema. Value can't be 0".*
		• If the input text is less than -999.	*"Value must be at least -999."*
		• If the input text is greater than 999.	*"Value must be at most 999."*
		• If the input text contains negative (-) after the integer.	*"Value must be of type integer. Value must be at most 999. Value must be at least -999."*
Underlying Instrument Index Term Unit	Enumeration Validation	This attribute is required if the selected Underlier ID Source is CRIDX or PROP where enumerated values are [DAYS, WEEK, MNTH, YEAR]. • If the selected Underlier ID Source is CRIDX or PROP and Underlying Instrument Index Term Unit has no input value.	*"Must have property UnderlyingInstrumentIndexTermUnit"*
	Numeric Validation	If the selected Underlier ID Source is CRIDX, the input text must be an integer from 1 to 999.	

Underlying Credit Index Series / Index Version *[Underlier ID Source = CRIDX]*		• If the selected Underlier ID Source is CRIDX and these attributes have no input values.	*"Must have property UnderlyingCreditIndexSeries"* *"Must have property UnderlyingCreditIndexVersion"*
		• If the selected Underlier ID Source is CRIDX where the input text is equal to 0.	*"Error: Index Series and Index Version can only be zero if there are more than 1 Underlying Instrument Indices or at least 1 Index Prop."*
		• If the selected Underlier ID Source is CRIDX where the input text is less than 0.	*"Value must be at least 0."*
		• If the selected Underlier ID Source is CRIDX where the input text is greater than 999.	*"Value must be at most 999."*
		• If the selected Underlier ID Source is CRIDX where the input text contains negative (-) after the integer.	*"Value must be of type integer. Value must be at most 999. Value must be at least 0".*
[Underlier ID Source = PROP]		If the selected Underlier ID Source is PROP, the input text must be an integer from 0 to 999.	
		• If the selected Underlier ID Source is PROP and these attributes have no input values.	*"Must have property UnderlyingCreditIndexSeries"* *"Must have property UnderlyingCreditIndexVersion"*
		• If the selected Underlier ID Source is PROP where the input text is less than 0.	*"Value must be at least 0."*
		• If the selected Underlier ID Source is PROP where the input text is greater than 999.	*"Value must be at most 999."*
		• If the input text contains negative (-) after the integer.	*"Value must be of type integer. Value must be at most 999. Value must be at least 0".*

4 Product Normalization

4.1 Introduction

The DSB will normalize data submitted by the user to ensure that the same UPI is returned for a given set of attributes.

4.2 Cross Currency Swaps Normalization

This section specifies normalization that applies to the following Cross Currency Swap products:

Asset Class	Instrument Type	Product
Rates	Swap	Cross.Currency.Fixed_Fixed
Rates	Swap	Cross.Currency.Fixed_Float
Rates	Swap	Cross.Currency.Fixed_Float_NDS
Rates	Swap	Cross.Currency.Zero_Coupon
Rates	Swap	Cross.Currency.Inflation_Swap

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example 1 (Normalization not required)		• Order the “Notional Currency” and “Other Notional Currency alphabetically. • If the “Notional Currency” is first alphabetically, then record it as “Notional Currency”. • If the “Notional Currency” is not first alphabetically, then record the field as “Other Notional Currency”.	***Example 1 (Normalization not applied)***	
Notional Currency	EUR		Notional Currency	EUR
Other Notional Currency	USD		Other Notional Currency	USD
Example 2 (Order Normalization required)			***Example 2 (Order Normalization applied)***	
Notional Currency	USD		Notional Currency	EUR
Other Notional Currency	EUR		Other Notional Currency	USD

4.3 Cross Currency Basis Swap Normalization

This section specify normalization that applies to Cross Currency Basis Swap.

Asset Class	Instrument Type	Product
Rates	Swap	Cross_Currency_Basis_Swap

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example 1 (Normalization not required)		• Order the "Notional Currency" and "Other Notional Currency" alphabetically. • If the "Notional Currency" is first alphabetically, then record it as "Notional Currency". • If the "Notional Currency" is not first alphabetically, then record it as "Other Notional Currency". The associated attributes of the Notional Currency will move as part of normalization.	***Example 1 (Normalization not applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlier ID/Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	3 MNTH		Reference Rate Term Value/Unit	3 MNTH
Other Notional Currency	USD		Other Notional Currency	USD
Other Leg Underlier ID/Other Leg Underlier ID Source	USD-LIBOR-BBA [FPML]		Other Leg Reference Rate	USD-LIBOR-BBA
Other Leg Ref. Rate Term Value/Unit	6 MNTH		Other Leg Ref. Rate Term Value/Unit	6 MNTH
Example 2 (Order Normalization required)			***Example 2 (Order Normalization applied)***	
Notional Currency	USD		Notional Currency	GBP
Underlier ID/Underlier ID Source	USD-LIBOR-BBA [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Value/Unit	6 MNTH		Reference Rate Term Value/Unit	3 MNTH
Other Notional Currency	GBP		Other Notional Currency	USD
Other Leg Underlier ID/Other Leg Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Other Leg Reference Rate	USD-LIBOR-BBA
Other Leg Ref. Rate Term Value/Unit	3 MNTH		Other Leg Ref. Rate Term Value/Unit	6 MNTH

Asset Class	Instrument Type	Product
Rates	Swap	Non_Standard_Swap
Rates	Option	Non_Standard_Option
Other	Other	Non_Standard (Miscellaneous)
Other	Option	Non_Standard_Option
Other	Swap	Non_Standard_Swap

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example 1 (Normalization not required)		If Notional Currency and Other Notional Currency are different: • Order the “Notional Currency” and “Other Notional Currency” alphabetically. • If the “Notional Currency” is first alphabetically, then record it as “Notional Currency”. • If the “Notional Currency” is not first alphabetically, then record it as “Other Notional Currency”. The associated attributes of the Notional Currency and Other Notional Currency will move as part of normalization.	***Example 1 (Normalization not applied)***	
Underlying Structure	Single Underlier		Underlier Characteristic	Single
Notional Currency	GBP		Notional Currency	GBP
Underlier ID/Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	3 MNTH		Reference Rate Term Value/Unit	3 MNTH
Other Leg Underlying Structure	Single Underlier		Other Leg Underlier Characteristic	Single
Other Notional Currency	USD		Other Notional Currency	USD
Other Leg Underlier ID/Other Leg Underlier ID Source	USD-LIBOR-BBA [FPML]		Other Leg Reference Rate	USD-LIBOR-BBA
Other Leg Ref. Rate Term Value/Unit	6 MNTH		Other Leg Ref. Rate Term Value/Unit	6 MNTH
Example 2 (Order Normalization required)			***Example 2 (Order Normalization applied)***	
Underlying Structure	Single Underlier		Underlier Characteristic	Basket
Notional Currency	USD		Notional Currency	GBP
Underlier ID/Underlier ID Source	USD-LIBOR-BBA [FPML]		Other Leg Underlier Characteristic	Single
Reference Rate Term Value/Unit	6 MNTH		Other Notional Currency	USD
Other Leg Underlying Structure	Basket		Other Leg Reference Rate	USD-LIBOR-BBA
Other Notional Currency	GBP		Other Leg Ref. Rate Term Value/Unit	6 MNTH

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example (Order Normalization required)		If only Notional Currency is selected: • If the input "Reference Rate" and "Other Leg Reference Rate". Arrange the Reference Rate and Other Leg Reference Rate alphabetically. The Reference Rate should be first alphabetically and Other Leg Reference Rate the second alphabetically. The associated attributes (Reference Rate Term Value + Reference Rate Term Unit) are then moved as part of the normalization.	***Example (Order Normalization applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlying Structure	Single Underlier		Underlier Characteristic	Single
Underlier ID/Underlier ID Source	USD-LIBOR-BBA [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	3 MNTH		Reference Rate Term Value/Unit	6 MNTH
Other Leg Underlying Structure	Single Underlier		Other Leg Underlier Characteristic	Single
Other Leg Underlier ID/Other Leg Underlier ID Source	GBP-SONIA-COMPOUND		Other Leg Reference Rate	USD-LIBOR-BBA
Other Leg Ref. Rate Term Value/Unit	6 MNTH		Other Leg Ref. Rate Term Value/Unit	3 MNTH
Example (Normalization not required)		If the input combination of Underlying Structure is "Single Underlier" and Other Leg Underlying Structure is "Basket", record the attributes as is.	***Example (Normalization not applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlying Structure	Single Underlier		Underlier Characteristic	Single
Underlier ID/Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	3 MNTH		Reference Rate Term Value/Unit	3 MNTH
Other Leg Underlying Structure	Basket		Other Leg Underlier Characteristic	Basket
Example (Normalization required)		If the input combination of Underlying Structure is "Basket" and Other Leg Underlying Structure is "Single Underlier", record the Other Leg as "Reference Rate" and Underlying Structure (Basket) as "Other Leg Underlier Characteristic". The associated attributes (Other Leg Reference Rate Term Value + Other Leg Reference Rate Term Unit) are then moved as part of the normalization and will change to "Reference Rate Term Value" + "Reference Rate Term Unit".	***Example (Normalization applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlying Structure	Basket		Underlier Characteristic	Single
Other Leg Underlying Structure	Single Underlier		Reference Rate	GBP-SONIA-COMPOUND
Other Leg Underlier ID/Other Leg Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Reference Rate Term Value/Unit	3 MNTH
Other Leg Ref. Rate Term Value/Unit	3 MNTH		Other Leg Underlier Characteristic	Basket
Example (Normalization not required)		If the input combination of Underlying Structure and Other Leg Underlying Structure is "Basket", record the attributes as is.	***Example (Normalization not applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlying Structure	Basket		Underlier Characteristic	Basket
Other Leg Underlying Structure	Basket		Other Leg Underlier Characteristic	Basket

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example 1 (Date Normalization required)</td><td rowspan="12">If only “Notional Currency” is selected and the Reference Rate and Other Leg Reference Rate are identical, the term value and unit will normalize to ensure that a single UPI is returned for the same set of attributes.
• If the Term Unit is the same, order the Term Value numerically from lowest to highest.
• If the Term Unit is different, convert the Term Unit as per order term multiplier below:
○ DAYS = 1
○ WEEK = 7
○ MNTH = 30
○ YEAR = 365
• Multiply the number of Term Value and order term multiplier for both reference rate legs. Then order the equivalent value numerically from lowest to highest as per example provided.</td><td colspan="2">Example 1 (Date Normalization applied)</td></tr>
<tr><td>Notional Currency</td><td>GBP</td><td>Notional Currency</td><td>GBP</td></tr>
<tr><td>Underlying Structure</td><td>Single Underlier</td><td>Underlier Characteristic</td><td>Single</td></tr>
<tr><td>Underlier ID</td><td>GBP-SONIA-COMPOUND</td><td rowspan="2">Reference Rate</td><td rowspan="2">GBP-SONIA-COMPOUND</td></tr>
<tr><td>Underlier ID Source</td><td>FPML</td></tr>
<tr><td>Reference Rate Term Value</td><td>15</td><td>Reference Rate Term Value</td><td>1</td></tr>
<tr><td>Reference Rate Term Unit</td><td>DAYS</td><td>Reference Rate Term Unit</td><td>WEEK</td></tr>
<tr><td>Other Leg Underlying Structure</td><td>Single Underlier</td><td>Other Leg Underlier Characteristic</td><td>Single</td></tr>
<tr><td>Other Underlier ID</td><td>GBP-SONIA-COMPOUND</td><td rowspan="2">Other Leg Reference Rate</td><td rowspan="2">GBP-SONIA-COMPOUND</td></tr>
<tr><td>Other Underlier ID Source</td><td>FPML</td></tr>
<tr><td>Other Leg Ref. Rate Term Value</td><td>1</td><td>Other Leg Ref. Rate Term Value</td><td>15</td></tr>
<tr><td>Other Leg Ref. Rate Term Unit</td><td>WEEK</td><td>Other Leg Ref. Rate Term Unit</td><td>DAYS</td></tr>
<tr><td colspan="2">Example 2 (Normalization not required)</td><td rowspan="12">• If the Reference Rate Term Value/Unit and Other Leg Reference Rate Term Value/Unit has the same equivalent value based on the order term multiplier, the details for the said attributes will be as is in the RECORD template</td><td colspan="2">Example 2 (Normalization not applied)</td></tr>
<tr><td>Notional Currency</td><td>GBP</td><td>Notional Currency</td><td>GBP</td></tr>
<tr><td>Underlying Structure</td><td>Single Underlier</td><td>Underlier Characteristic</td><td>Single</td></tr>
<tr><td>Underlier ID/Underlier ID Source</td><td>GBP-SONIA-COMPOUND</td><td rowspan="2">Reference Rate</td><td rowspan="2">GBP-SONIA-COMPOUND</td></tr>
<tr><td>Underlier ID Source</td><td>FPML</td></tr>
<tr><td>Reference Rate Term Value</td><td>1</td><td>Reference Rate Term Value</td><td>1</td></tr>
<tr><td>Reference Rate Term Unit</td><td>MONTH</td><td>Reference Rate Term Unit</td><td>MONTH</td></tr>
<tr><td>Other Leg Underlying Structure</td><td>Single Underlier</td><td>Other Leg Underlier Characteristic</td><td>Single</td></tr>
<tr><td>Other Underlier ID</td><td>GBP-SONIA-COMPOUND</td><td rowspan="2">Other Leg Reference Rate</td><td rowspan="2">GBP-SONIA-COMPOUND</td></tr>
<tr><td>Other Underlier ID Source</td><td>FPML</td></tr>
<tr><td>Other Leg Ref. Rate Term Value</td><td>30</td><td>Other Leg Ref. Rate Term Value</td><td>30</td></tr>
<tr><td>Other Leg Ref. Rate Term Unit</td><td>DAYS</td><td>Other Leg Ref. Rate Term Unit</td><td>DAYS</td></tr>
</table>

4.4 Basis Swaps Normalization

This section specify normalization that applies to Basis Swap products.

Asset Class	Instrument Type	Product
Rates	Swap	Basis
Rates	Swap	Basis_OIS
Rates	Swap	Inflation_Basis
Rates	Swap	Inflation_Basis_Zero_Coupon
Rates	Swap	Inflation_Basis_YoY

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example 1 (Normalization not required)		• Order the “Reference Rate” and “Other Reference Rate” alphabetically. • If the “Reference Rate” is first alphabetically, then record it as “Reference Rate”. • If the “Reference Rate” is not first alphabetically, then record the field as “Other Reference Rate”. If only “Notional Currency” is selected and if the Reference Rate and Other Leg Reference Rate are identical, the term value and unit will normalize to ensure that a single UPI is returned for the same set of attributes. • If the Term Unit is the same, order the Term Value numerically from lowest to highest. • If the Term Unit is different, convert the Term Unit as per order term multiplier below: ○ DAYS = 1 ○ WEEK = 7 ○ MNTH = 30 ○ YEAR = 365 Multiply the number of Term Value and order term multiplier for both reference rate legs. Then order the equivalent value numerically from lowest to highest as per example provided.	***Example 1 (Normalization not applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlier ID/Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	3 MNTH		Reference Rate Term Value/Unit	3 MNTH
Other Leg Underlier ID/Other Leg Underlier ID Source	USD-LIBOR-BBA [FPML]		Other Leg Reference Rate	USD-LIBOR-BBA
Other Leg Ref. Rate Term Value/Unit	6 MNTH		Other Leg Ref. Rate Term Value/Unit	6 MNTH
Example 2 (Order Normalization required)			***Example 2 (Order Normalization applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlier ID/Underlier ID Source	USD-LIBOR-BBA [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	6 MNTH		Reference Rate Term Value/Unit	3 MNTH
Other Leg Underlier ID/Other Leg Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Other Leg Reference Rate	USD-LIBOR-BBA
Other Leg Ref. Rate Term Value/Unit	3 MNTH		Other Leg Ref. Rate Term Value/Unit	6 MNTH
Example 3 (Date Normalization required)			***Example 3 (Date Normalization applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlier ID/Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	15 DAYS		Reference Rate Term Value/Unit	1 WEEK
Other Leg Underlier ID/Other Leg Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Other Leg Reference Rate	GBP-SONIA-COMPOUND
Other Leg Ref. Rate Term Value/Unit	1 WEEK		Other Leg Ref. Rate Term Value/Unit	15 DAYS
Example 4 (Normalization not required)		• If the Reference Rate Term Value/Unit and Other Leg Reference Rate Term Value/Unit has the same equivalent value based on the order term multiplier, the details for the said attributes will be as is in the RECORD template.	***Example 4 (Normalization not applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlier ID/Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Reference Rate	GBP-SONIA-COMPOUND
Reference Rate Term Value/Unit	1 MONTH		Reference Rate Term Value/Unit	1 MONTH
Other Leg Underlier ID/Other Leg Underlier ID Source	GBP-SONIA-COMPOUND [FPML]		Other Leg Reference Rate	GBP-SONIA-COMPOUND
Other Leg Ref. Rate Term Value/Unit	30 DAYS		Other Leg Ref. Rate Term Value/Unit	30 DAYS

4.5 FX Normalization

This section specify normalization that applies to the following FX Swap and FX Forward products.

Asset Class	Instrument Type	Product
Foreign_Exchange	Swap	FX_Swap
Foreign_Exchange	Swap	Non_Deliverable_FX_Swap
Foreign_Exchange	Forward	NDF
Foreign_Exchange	Forward	Forward
Foreign_Exchange	Forward	Vol_Var
Foreign_Exchange	Forward	Rolling_Spot
Foreign_Exchange	Forward	Contract_For_Difference
Foreign_Exchange	Forward	Spreadbet
Foreign_Exchange	Forward	Non_Standard Forward

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example 1 (Normalization not required)		• Order the "Underlier ID" and "Other Underlier ID alphabetically. • If the input "Underlier ID" is first alphabetically, then record it as "Notional Currency". • If the input "Underlier ID" is not first alphabetically, then record it as "Other Notional Currency".	***Example 1 (Normalization not applied)***	
Underlier ID/Underlier ID Source	EUR [CCY]		Notional Currency	EUR
Other Underlier ID/Other Underlier ID Source	GBP [CCY]		Other Notional Currency	GBP
Example 2 (Order Normalization required)			***Example 2 (Order Normalization applied)***	
Underlier ID/Underlier ID Source	GBP [CCY]		Notional Currency	EUR
Other Underlier ID/Other Underlier ID Source	EUR [CCY]		Other Notional Currency	GBP

4.6 FX Option Normalization

This section specify normalization that applies to the following FX Option products.

Asset Class	Instrument Type	Product
Foreign_Exchange	Option	NDO
Foreign_Exchange	Option	Vanilla_Option
Foreign_Exchange	Option	Barrier_Option
Foreign_Exchange	Option	Digital_Option
Foreign_Exchange	Option	Target_Option
Foreign_Exchange	Option	Forward_Vol_Agreement
Foreign_Exchange	Option	FX_Non_Standard_Option

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example 1 (Normalization not required)</td><td rowspan="10">Order the “Notional Currency” and “Other Notional Currency” alphabetically.
If the “Notional Currency” is first alphabetically, then record the currency pair and option type value as is in the record.
If the “Notional Currency” is not first alphabetically, then record it as “Other Notional Currency” and change the option type value. If option type value is “PUTO”, change it to “CALL” and vice versa.
If the option type value is “OPTL”, alphabetical normalization approach in the currency pair shall apply and keep option value type as “OPTL”.</td><td colspan="2">Example 1 (Normalization not applied)</td></tr>
<tr><td>Underlier ID/Underlier ID Source</td><td>EUR [CCY]</td><td>Notional Currency</td><td>EUR</td></tr>
<tr><td>Other Underlier ID/Other Underlier ID Source</td><td>GBP [CCY]</td><td>Other Notional Currency</td><td>GBP</td></tr>
<tr><td>Option Type</td><td>PUTO</td><td>Option Type</td><td>PUTO</td></tr>
<tr><td>Option Exercise Style</td><td>EURO</td><td>Option Exercise Style</td><td>EURO</td></tr>
<tr><td colspan="2">Example 2 (Order Normalization required)</td><td colspan="2">Example 2 (Order Normalization applied)</td></tr>
<tr><td>Underlier ID/Underlier ID Source</td><td>GBP [CCY]</td><td>Notional Currency</td><td>EUR</td></tr>
<tr><td>Other Underlier ID/Other Underlier ID Source</td><td>EUR [CCY]</td><td>Other Notional Currency</td><td>GBP</td></tr>
<tr><td>Option Type</td><td>PUTO</td><td>Option Type</td><td>CALL</td></tr>
<tr><td>Option Exercise Style</td><td>EURO</td><td>Option Exercise Style</td><td>EURO</td></tr>
</table>

4.7 Term Value / Term Unit Normalization

This section specifies the normalization applicable for Reference Rate Term Value / Unit and Underlying Instrument Index Term Value / Unit where it is applicable.

4.7.1 Reference Rate Term Value / Unit

Asset Class	Instrument Type	Product
Rates	Swap	Fixed_Float
Rates	Swap	Fixed_Float_Zero_Coupon
Rates	Swap	Fixed_Float_OIS
Rates	Swap	Inflation_Fixed_Float_Zero_Coupon
Rates	Swap	Inflation_Swap
Rates	Swap	Inflation_Fixed_Float_YoY
Rates	Swap	Cross_Currency_Zero_Coupon
Rates	Swap	Cross_Currency_Inflation_Swap
Rates	Swap	Cross_Currency_Fixed_Float
Rates	Swap	Cross_Currency_Fixed_Float_NDS
Rates	Swap	Basis
Rates	Swap	Basis_OIS
Rates	Swap	Inflation_Basis
Rates	Swap	Inflation_Basis_YoY
Rates	Swap	Inflation_Basis_Zero_Coupon
Rates	Swap	Cross_Currency_Basis
Rates	Swap	Non_Standard_Swap
Rates	Forward	FRA_Index
Other	Forward	Non_Standard_Forward
Other	Option	Non_Standard_Option

Asset Class	Instrument Type	Product
Other	Swap	Non_Standard_Swap
Other	Other	Non_Standard (Miscellaneous)

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example 1 (Normalization not required)</td><td rowspan="8">If Reference Rate Term Unit = “DAYS” and Reference Rate Term Value is divisible by 7, record it in weeks.
If Reference Rate Term Unit = “MNTH” and Reference Rate Term Value is divisible by 12, record it in years.
If Reference Rate Term Value is 0 and Reference Rate Term Unit is anything other than DAYS, it will be recorded as 0 DAYS.
Note: This normalization is applicable all instruments for both legs.</td><td colspan="2">Example 1 (Normalization not applied)</td></tr>
<tr><td>Reference Rate Term Value/Unit</td><td>3 DAYS</td><td>Reference Rate Term Value/Unit</td><td>3 DAYS</td></tr>
<tr><td colspan="2">Example 2 (Date Normalization required)</td><td colspan="2">Example 2 (Date Normalization applied)</td></tr>
<tr><td>Reference Rate Term Value/Unit</td><td>7 DAYS</td><td>Reference Rate Term Value/Unit</td><td>1 WEEK</td></tr>
<tr><td colspan="2">Example 3 (Date Normalization required)</td><td colspan="2">Example 3 (Date Normalization applied)</td></tr>
<tr><td>Reference Rate Term Value</td><td>12 MNTH</td><td>Reference Rate Term Value/Unit</td><td>1 YEAR</td></tr>
<tr><td colspan="2">Example 4 (Date Normalization required)</td><td colspan="2">Example 4 (Date Normalization applied)</td></tr>
<tr><td>Reference Rate Term Value/Unit</td><td>0 WEEK</td><td>Reference Rate Term Value</td><td>0 DAYS</td></tr>
</table>

4.7.3 Underlying Instrument Index Term Value / Unit

Asset Class	Instrument Type	Product
Rates	Option	CapFloor
Rates	Option	Inflation_CapFloor
Credit	Swap	Index
Credit	Swap	Index_Tranche
Credit	Swap	Total_Return_Swap
Credit	Swap	Non_Standard_Swap
Credit	Option	Non_Standard_Option
Other	Option	Non_Standard_Option
Other	Swap	Non_Standard_Swap
Other	Other	Non_Standard (Miscellaneous)

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example 1 (Normalization not required)</td><td rowspan="8">• If Underlying Instrument Index Term Unit = “DAYS” and Underlying Instrument Index Term Value is divisible by 7, record it in weeks.
• If Underlying Instrument Index Term Unit = “MNTH” and Underlying Instrument Index Term Value is divisible by 12, record it in years.
• If Underlying Instrument Index Term Value is 0 and Underlying Instrument Index Term Unit is anything other than DAYS, it will be recorded as 0 DAYS.</td><td colspan="2">Example 1 (Normalization not applied)</td></tr>
<tr><td>Underlying Instrument Index Term Value/Unit</td><td>3 DAYS</td><td>Underlying Instrument Index Term Value/Unit</td><td>3 DAYS</td></tr>
<tr><td colspan="2">Example 2 (Date Normalization required)</td><td colspan="2">Example 2 (Date Normalization applied)</td></tr>
<tr><td>Underlying Instrument Index Term Value/Unit</td><td>7 DAYS</td><td>Underlying Instrument Index Term Value/Unit</td><td>1 WEEK</td></tr>
<tr><td colspan="2">Example 3 (Date Normalization required)</td><td colspan="2">Example 3 (Date Normalization applied)</td></tr>
<tr><td>Underlying Instrument Index Term Value/Unit</td><td>12 MNTH</td><td>Underlying Instrument Index Term Value/Unit</td><td>1 YEAR</td></tr>
<tr><td colspan="2">Example 4 (Date Normalization required)</td><td colspan="2">Example 4 (Date Normalization applied)</td></tr>
<tr><td>Underlying Instrument Index Term Value/Unit</td><td>0 WEEK</td><td>Underlying Instrument Index Term Value/Unit</td><td>0 DAYS</td></tr>
</table>

4.8 Underlying Instrument Index Normalization

This section specify normalization that applies to the following Equity and Multi-Asset products.

Asset Class	Instrument Type	Product
Equity	Swap	Price_Return_Basic_Performance_Single_Index
Equity	Swap	Parameter_Return_Dividend_Single_Index
Equity	Swap	Parameter_Return_Variance_Single_Index
Equity	Swap	Price_Return_Basic_Performance_Single_Index_CFD
Equity	Swap	Parameter_Return_Volatilty_Single_Index
Equity	Swap	Portfolio_Swap_Single_Index
Equity	Swap	Non_Standard_Swap
Equity	Forward	Price_Return_Basic_Performance_Single_Index_CFD
Equity	Forward	Price_Return_Basic_Performance_Single_Index
Equity	Forward	Non_Standard_Forward
Equity	Option	Single_Index
Equity	Option	Non_Standard_Option
Other	Forward	Non_Standard_Forward
Other	Option	Non_Standard_Option
Other	Swap	Non_Standard_Swap
Other	Other	Non_Standard (Miscellaneous)

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example 1 (ID Normalization required)</td><td rowspan="4">For any given Equity Index submission, a validation will apply against the existence of an ISIN and return the Index ISIN as part of the record in place of the Index Name.
If Equity Index Name has no associated Equity Index ISIN, the Equity Index Name input by the user will return in the record.
List of Equity Indices and associated ISINs can be found <u>here</u>.</td><td colspan="2">Example 1 (ID Normalization applied)</td></tr>
<tr><td>Underlier ID/Underlier ID Source</td><td>KOSPI 200 [EQIDX]</td><td>Underlying Instrument ISIN</td><td>KRD020020016</td></tr>
<tr><td colspan="2">Example 2 (Normalization not required)</td><td colspan="2">Example 2 (Normalization not applied)</td></tr>
<tr><td>Underlier ID/Underlier ID Source</td><td>NIKKEI 225 INDEX [EQIDX]</td><td>Underlying Instrument Index</td><td>NIKKEI 225 INDEX</td></tr>
</table>

4.9 Commodity Basis Normalization

This section specifies the normalization for the following product.

Asset Class	Instrument Type	Product
Commodities	Swap	Basis_Swap
Commodities	Swap	Non_Standard_Swap
Other	Other	Non_Standard (Miscellaneous)
Other	Swap	Non_Standard_Swap

a. For basis-style product, if the Underlying Structure and Other Underlying Structure selected is “Single Underlier” [COMM], record the attributes as follows:

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example (Order Normalization required)</td><td rowspan="12">Order alphabetically the combination string of “Base Product + Sub Product + Additional Sub Product + Reference Rate” and “Other Base Product + Other Sub Product + Other Additional Sub Product + Other Reference Rate”.
If “Base Product” and “Other Base Product” are different – alphabetically order them. The Base Product should be the first alphabetically and Other Base Product the second alphabetically. The associated attributes (Sub Product + Additional Sub Product + Reference Rate) are then moved as part of the normalization.
If Base Product and Other Base Product are the same, and if “Sub product” and “Other Sub product” are different – alphabetically order them. The Sub Product should be the first alphabetically and Other Sub Product the second alphabetically. The associated attributes (Additional Sub Product + Reference Rate) are then moved as part of the normalization.
If Base Product and Sub Product are the same as Other Base Product and Other Sub Product, and if “Additional Sub Product” and “Other Additional Sub product” are different – alphabetically order them. The Additional Sub Product should be the first alphabetically and Other Additional Sub Product the second alphabetically. The associated Reference Rate is then moved as part of the normalization.</td><td colspan="2">Example (Order Normalization applied)</td></tr>
<tr><td>Notional Currency</td><td>GBP</td><td>Notional Currency</td><td>GBP</td></tr>
<tr><td>Underlying Structure</td><td>Single Underlier</td><td>Underlier Characteristic</td><td>Single</td></tr>
<tr><td>Underlier ID/ID Source</td><td>NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC [COMM]</td><td>Reference Rate</td><td>WHEAT FEED-NYSE Liffe</td></tr>
<tr><td>Base Product</td><td>NRGY</td><td>Base Product</td><td>AGRI</td></tr>
<tr><td>Sub Product</td><td>NGAS</td><td>Sub Product</td><td>GROS</td></tr>
<tr><td>Additional Sub Product</td><td>GASP</td><td>Additional Sub Product</td><td>FWHT</td></tr>
<tr><td>Other Underlying Structure</td><td>Single Underlier</td><td>Other Underlier Characteristic</td><td>Single</td></tr>
<tr><td>Other Underlier ID/ID Source</td><td>WHEAT FEED-NYSE Liffe [COMM]</td><td>Other Reference Rate</td><td>NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC</td></tr>
<tr><td>Other Base Product</td><td>AGRI</td><td>Other Base Product</td><td>NRGY</td></tr>
<tr><td>Other Sub Product</td><td>GROS</td><td>Other Sub Product</td><td>NGAS</td></tr>
<tr><td>Other Additional Sub Product</td><td>FWHT</td><td>Other Additional Sub Product</td><td>GASP</td></tr>
</table>

b. For basis-style product, if the Underlying Structure selected is “Single Underlier” [COMM] and Other Underlying Structure selected is “Basket” [BSKT] and the input Base Product/ Sub Product/ Additional Sub Product and Other Base Product/ Other Sub Product/ Other Additional Sub Product are different, record the attributes as follows:

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example (Order Normalization required)</td><td rowspan="12">• Order alphabetically the combination string of “Base Product + Sub Product + Additional Sub Product + Reference Rate” and “Other Base Product + Other Sub Product + Other Additional Sub Product + Basket”.
• If “Base Product” and “Other Base Product” are different – alphabetically order them. The Base Product should be the first alphabetically and Other Base Product the second alphabetically. The associated attributes (Sub Product + Additional Sub Product + Reference Rate) are then moved as part of the normalization.
• If Base Product and Other Base Product are the same, and if “Sub product” and “Other Sub product” are different – alphabetically order them. The Sub Product should be the first alphabetically and Other Sub Product the second alphabetically. The associated attributes (Additional Sub Product + Reference Rate) are then moved as part of the normalization.
• If Base Product and Sub Product are the same as Other Base Product and Other Sub Product, and if “Additional Sub Product” and “Other Additional Sub product” are different – alphabetically order them. The Additional Sub Product should be the first alphabetically and Other Additional Sub Product the second alphabetically. The associated Reference Rate is then moved as part of the normalization.</td><td colspan="2">Example (Order Normalization applied)</td></tr>
<tr><td>Notional Currency</td><td>GBP</td><td>Notional Currency</td><td>GBP</td></tr>
<tr><td>Underlying Structure</td><td>Single Underlier</td><td rowspan="2">Underlier Characteristic</td><td rowspan="2">Basket</td></tr>
<tr><td>Underlier ID/ID Source</td><td>NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC [COMM]</td></tr>
<tr><td>Base Product</td><td>NRGY</td><td>Base Product</td><td>AGRI</td></tr>
<tr><td>Sub Product</td><td>NGAS</td><td>Sub Product</td><td>GROS</td></tr>
<tr><td>Additional Sub Product</td><td>GASP</td><td>Additional Sub Product</td><td>FWHT</td></tr>
<tr><td rowspan="2">Other Underlying Structure</td><td rowspan="2">Basket</td><td>Other Underlier Characteristic</td><td>Single</td></tr>
<tr><td>Other Reference Rate</td><td>NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC</td></tr>
<tr><td>Other Base Product</td><td>AGRI</td><td>Other Base Product</td><td>NRGY</td></tr>
<tr><td>Other Sub Product</td><td>GROS</td><td>Other Sub Product</td><td>NGAS</td></tr>
<tr><td>Other Additional Sub Product</td><td>FWHT</td><td>Other Additional Sub Product</td><td>GASP</td></tr>
</table>

c. For basis-style product, if the Underlying Structure selected is “Single Underlier” [COMM] and Other Underlying Structure selected is “Basket” [BSKT] and the input Base Product/Sub Product/Additional Sub Product and Other Base Product/Other Sub Product/Other Additional Sub Product are the same, record the attributes as follows:

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example 1 (Order Normalization not required)		• If “Base Product/ Sub Product/ Additional Sub Product” and “Other Base Product/ Other Sub Product/ Other Additional Sub Product” are the same, order Reference Rate as the first leg and Basket as the other leg.	***Example 2 (Order Normalization not applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlying Structure	Single Underlier		Underlier Characteristic	Single
Underlier ID/Underlier ID Source	NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC [COMM]		Reference Rate	NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC
Base Product	NRGY		Base Product	NRGY
Sub Product	NGAS		Sub Product	NGAS
Additional Sub Product	GASP		Additional Sub Product	GASP
Other Underlying Structure	Basket		Other Underlier Characteristic	Basket
Other Base Product	NRGY		Other Base Product	NRGY
Other Sub Product	NGAS		Other Sub Product	NGAS
Other Additional Sub Product	GASP		Other Additional Sub Product	GASP
Example 2 (Order Normalization required)			***Example 2 (Order Normalization applied)***	
Notional Currency	GBP		Notional Currency	GBP
Underlying Structure	Basket		Underlier Characteristic	Single
Base Product	NRGY		Reference Rate	NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC
Sub Product	NGAS		Base Product	NRGY
Additional Sub Product	GASP		Sub Product	NGAS
Other Underlying Structure	Single Underlier		Additional Sub Product	GASP
Underlier ID/Underlier ID Source	NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC [COMM]		Other Underlier Characteristic	Basket
Other Base Product	NRGY		Other Base Product	NRGY
Other Sub Product	NGAS		Other Sub Product	NGAS
Other Additional Sub Product	GASP		Other Additional Sub Product	GASP

d. If the Underlying Structure and Other Underlying Structure selected is “Single Underlier” [COMM] and Other Notional Currency is selected, record the attributes as follows:

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example (Order Normalization required)		• Order the attributes alphabetically. The Notional Currency should be first alphabetically and Other Notional Currency the second alphabetically. The associated attributes of the Notional Currency will move as part of normalization.	***Example (Order Normalization applied)***	
Notional Currency	GBP		Notional Currency	EUR
Underlying Structure	Single Underlier		Underlier Characteristic	Single
Underlier ID/Underlier ID Source	NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC [COMM]		Reference Rate	WHEAT FEED-NYSE Liffe
Base Product	NRGY		Base Product	AGRI
Sub Product	NGAS		Sub Product	GROS
Additional Sub Product	GASP		Additional Sub Product	FWHT
Other Notional Currency	EUR		Other Notional Currency	GBP
Other Underlying Structure	Single Underlier		Other Underlier Characteristic	Single
Other Underlier ID/Other Underlier ID Source	WHEAT FEED-NYSE Liffe [COMM]		Other Reference Rate	NATURAL GAS-CHICAGO CITY-GATES-INSIDE FERC
Other Base Product	AGRI		Other Base Product	NRGY
Other Sub Product	GROS		Other Sub Product	NGAS
Other Additional Sub Product	FWHT		Other Additional Sub Product	GASP

e. If the Underlying Structure combination is "Basket" [BSKT] and Other Notional Currency is selected, record the attributes as follows:

REQUEST (Input)	Example Value	Normalization	RECORD (Output)	Example Value
Example (Order Normalization required)		• Order the attributes alphabetically. The Notional Currency should be first alphabetically and Other Notional Currency the second alphabetically. The associated attributes of the Notional Currency will move as part of normalization.	***Example (Order Normalization applied)***	
Notional Currency	EUR		Notional Currency	AUD
Underlying Structure	Basket		Underlier Characteristic	Basket
Base Product	NRGY		Base Product	AGRI
Sub Product	NGAS		Sub Product	GROS
Additional Sub Product	GASP		Additional Sub Product	FWHT
Other Notional Currency	AUD		Other Notional Currency	EUR
Other Underlying Structure	Basket		Other Underlier Characteristic	Basket
Other Base Product	AGRI		Other Base Product	NRGY
Other Sub Product	GROS		Other Sub Product	NGAS
Other Additional Sub Product	FWHT		Other Additional Sub Product	GASP

4.10 Underlying Structure (oneOf structure) / Underlier Characteristic Normalization

This section specifies the derivation based on the selected underlying structure that applies to the following products.

Asset Class	Instrument Type	Product
Rates	Swap	Non_Standard_Swap
Rates	Option	Non_Standard_Option
Rates	Forward	Debt
Credit	Forward	Non_Standard_Forward
Credit	Swap	Non_Standard_Swap
Credit	Option	Non-Standard_Option
Commodities	Forward	Non_Standard_Forward
Commodities	Option	Non_Standard_Option
Commodities	Swap	Non_Standard_Swap
Equity	Swap	Non_Standard_Swap
Equity	Option	Non_Standard_Option
Equity	Forward	Non_Standard_Forward
Other	Forward	Non_Standard_Forward
Other	Option	Non_Standard_Option
Other	Swap	Non_Standard_Swap
Other	Other	Non_Standard (Miscellaneous)

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Normalization</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example 1 (Classification Normalization required)</td><td rowspan="4">If Underlying Structure selected is a “Single Underlier”, then record the attribute as “Underlier Characteristic” with value “Single” in the RECORD template.
If Underlying Structure selected is “Basket”, then record the attribute as “Underlier Characteristic” with value “Basket” in the RECORD template.
Note: This normalization is applicable all instruments for both legs.</td><td colspan="2">Example 1 (Classification Normalization applied)</td></tr>
<tr><td>Underlying Structure</td><td>Single Underlier</td><td>Underlier Characteristic</td><td>Single</td></tr>
<tr><td colspan="2">Example 2 (Classification Normalization required)</td><td colspan="2">Example 2 (Classification Normalization applied)</td></tr>
<tr><td>Underlying Structure</td><td>Basket</td><td>Underlier Characteristic</td><td>Basket</td></tr>
</table>

5 PRODUCT DERIVATION

5.1 Introduction

The DSB will derive the data submitted by the user to ensure that the same UPI is returned for a given set of attributes.

5.2 Underlier Characteristic Derivation

This section specifies the derivation based on the selected underlying structure that applies to the following products.

Asset Class	Instrument Type	Product
Commodities	Forward	Multi_Exotic_Forward
Commodities	Option	Multi_Exotic_Option
Commodities	Swap	Multi_Exotic_Swap

REQUEST (Input)	Example Value	Derivation	RECORD (Output)	Example Value
N/A		• This product is assumed to be a "Basket" in all cases, hence in accordance with ISO 4914 (UPI), there is no need to define individual constituents within this template.	***Example (Classification Derivation applied)***	
N/A	N/A		Underlier Characteristic	Basket

5.3 Underlier ID / Underlying Instrument ISIN Derivation

This section specifies the derivation based on the selected Asset Class and Underlier Type that applies to the following products.

Asset Class	Instrument Type	Product	Underlying Asset Class	Underlying Asset Type	Underlier Type
Rates	Forward	Debt	Rates		
Rates	Forward	FRA Other	Rates		
Rates	Option	Debt Option	Rates		
Credit	Swap	Corporate	Credit		Fixed Income Security
Credit	Swap	Municipal	Credit		Fixed Income Security
Credit	Swap	Sovereign	Credit		Fixed Income Security
Credit	Swap	Loan	Credit		Fixed Income Security
Credit	Swap	ABS	Credit		Fixed Income Security
Credit	Swap	Total Return Swap	Credit		Fixed Income Security
Credit	Swap	Non-Standard Swap	Credit	Single Name	Fixed Income Security
				Other	Fixed Income Security
Credit	Option	Non-Standard Option	Credit	CDS on Single Name	Fixed Income Security
				Swaps	Fixed Income Security
				Other	Fixed Income Security
Credit	Forward	Non-Standard Forward	Credit		Fixed Income Security
Credit	Forward	Debt	Credit		Fixed Income Security
Equity	Swap	Price Return Basic Performance Single Name	Equity		
Equity	Swap	Parameter Return Dividend Single Name	Equity		
Equity	Swap	Parameter Return Variance Single Name	Equity		
Equity	Swap	Parameter Return Volatility Single Name	Equity		
Equity	Swap	Price Return Basic Performance Single Name CFD	Equity		

Asset Class	Instrument Type	Product	Underlying Asset Class	Underlying Asset Type	Underlier Type
Equity	Forward	Price Return Basic Performance Single Name CFD	Equity		
Equity	Option	Single Name	Equity		
Equity	Forward	Price Return Basic Performance Single Name	Equity		
Equity	Swap	Portfolio Swap Other	Equity		
Equity	Swap	Portfolio Swap Single Name	Equity		
Equity	Swap	Non_Standard Swap	Equity	Single Stock	
				Other	
Equity	Option	Non_Standard Option	Equity	Single Stock	
				Other	
				Options	
Equity	Forward	Non_Standard Forward	Equity	Forwards	
				Futures	
				Single Stock	
				Options	
				Futures	
Other	Swap	Non_Standard Swap	Credit		Fixed Income Security
			Equity		Equity Identifier
Other	Option	Non_Standard Option	Credit		Fixed Income Security
			Equity		Equity Identifier
Other	Other	Non_Standard (Miscellaneous)	Credit		Fixed Income Security
			Equity		Equity Identifier
Other	Forward	Non_Standard Forward	Credit		Fixed Income Security
			Equity		Equity Identifier
			Rates		Fixed Income Security

<table>
<tr><th>REQUEST (Input)</th><th>Example Value</th><th>Derivation</th><th>RECORD (Output)</th><th>Example Value</th></tr>
<tr><td colspan="2">Example 1 (ID Derivation not required)</td><td rowspan="6">If the Underlier ID Source selected is the Primary ID Source [ISIN]; then the RECORD template must return the Primary Underlier ID as part of the UPI Record.
If the Underlier ID Source selected is one of the following Alternative Underlier ID Source values, i.e., [RIC; FIGI; CUSIP; SEDOL]; then the RECORD template must return the Primary Underlier ID mapped from the input Alternative Underlier ID as part of the UPI Record.</td><td colspan="2">Example 1 (ID Derivation not applied)</td></tr>
<tr><td>Underlier ID Source</td><td>ISIN</td><td rowspan="2">Underlying Instrument ISIN</td><td rowspan="2">US677520XZ65</td></tr>
<tr><td>Underlier ID</td><td>US677520XZ65</td></tr>
<tr><td colspan="2">Example 2 (ID Derivation required)</td><td colspan="2">Example 2 (ID Derivation applied)</td></tr>
<tr><td>Underlier ID Source</td><td>RIC</td><td rowspan="2">Underlying Instrument ISIN</td><td rowspan="2">DE000HVB2KF7</td></tr>
<tr><td>Underlier ID</td><td>DEHVB2KF=</td></tr>
</table>

5.4 Underlier Name Derivation

This section contains the list of underlying derivation rules based on the selected underlying asset(s).

The Underlier Name (for Underlying ISIN and Underlying LEI) is derived from third-party reference data sources at the time of UPI creation. The value is stored against the UPI at that time and subsequent updates to the name of the underlier will not be reflected in the UPI record.

Asset Class	Underlying Asset	Underlier Name	Underlier Name Source Attribute	Example value of Underlier Name
Rates	Reference Rate	UPI record	Reference Rate	EUR-EuroSTR-COMPOUND
Rates	Pair of Reference Rates	UPI record	Reference Rate vs Other Leg Reference Rate	EUR-EURIBOR-Reuters vs EUR-EuroSTR-COMPOUND
Rates	Basket	Constant	N/A	Basket
Rates	Underlying ISIN	ISIN Reference Data	longName of Underlying Instrument ISIN	
			• ISIN is found in ISIN Reference Data.	VODAFONE GROUP PLC
			• ISIN is found in ISIN Reference Data, but its description is missing.	No name available
			• ISIN is not found in ISIN Reference Data.	No name obtainable
Rates	Underlying UPI	Underlying UPI Record	FISN of Underlying Instrument UPI	NA/Swap Flt Flt EUR
Rates	No Underlying	Constant	N/A	“N/A”
Credit	Underlying ISIN	ISIN Reference Data	longName of Underlying Instrument ISIN	
			• ISIN is found in ISIN Reference Data.	GOTD 5.750 12/07/28
			• ISIN is found in ISIN Reference Data, but its description is missing.	No name available
			• ISIN is not found in ISIN Reference Data.	No name obtainable

Credit	Underlying LEI	LEI Reference Data	The name of the legal entity	
			• LEI is found in LEI Reference Data.	MICROSOFT CORPORATION
			• LEI is found in LEI Reference Data, but its legal name is missing.	No name available
			• LEI is not found in LEI Reference Data.	No name obtainable
Credit	Underlying UPI	Underlying UPI Record	FISN of Underlying Instrument UPI	NA/CDS Corp SN Sr
Credit	Underlying Index	UPI record	Underlying Instrument Index	ITRAXX EUROPE
Credit	Underlying Index Prop	UPI record	Underlying Instrument Index Prop	11339-MLSREISU
Credit	Basket	Constant	N/A	Basket
Foreign Exchange	Currency Pair	UPI record	Notional Currency/ Other Notional Currency	GBP USD
Commodities	Reference Rate	UPI record	Reference Rate	ALUMINIUM-LME CASH
Commodities	Underlying Index	UPI record	Underlying Instrument Index	OTHER
Commodities	Underlying Index Prop	UPI record	Underlying Instrument Index Prop	11339-BABXSG01
Commodities	Underlying UPI	UPI record	FISN of Underlying Instrument UPI	NA/Swap METL COPR USD 20221219
Commodities	Pair of Reference Rates	UPI record	Reference Rate vs Other Reference Rate	OIL-JCC-DETAILED vs BRENT/BFOEOIL-BRENT/BFOE-ICE
Commodities	Basket	Constant	N/A	Basket
Equity	Underlying ISIN	ISIN Reference Data	longName of Underlying Instrument ISIN	
			• ISIN is found in ISIN Reference Data.	International Business Machines Ord Shs
			• ISIN is found in ISIN Reference Data, but its description is missing.	No name available
			• ISIN is not found in ISIN Reference Data.	No name obtainable
Equity	Underlying Index	UPI record	Underlying Instrument Index	MSCI EM USD*
Equity	Underlying Index	UPI record	Underlying Instrument ISIN	FTSE 100 INDEX**
Equity	Underlying Index Prop	UPI record	Underlying Instrument Index Prop	34810-JPCFNAMR

Equity	Basket	Constant	N/A	Basket

**Where user enters an Equity Index Name not mapped to the Index ISIN, the system will define Underlier Name as the Underlying Instrument Index, e.g., 'MSCI EM USD'.*
***Where use enters an Equity Index Name mapped to the Index ISIN, the system will define Underlier Name* as *Underlying Equity Index Name instead of looking up longName of the associated ISIN in the ISIN Reference Data, e.g., 'FTSE 100 INDEX'.*

sset Class	Underlying Asset Class	Underlying Structure	Other Leg Underlying Structure	Underlying Asset	Underlier Name Source	Underlier Name Source Attribute	Example value of Underlier Name
Other	Rates	Single Underlier	Single Underlier	Reference Rate / Other Leg Reference Rate	UPI record	Reference Rate / Other Leg Reference Rate	EUR-EURIBOR-Reuters vs EUR-EuroSTR-COMPOUND
		Basket	Basket	N/A	Constant	N/A	Basket vs Basket
		Single Underlier	Basket	Reference Rate	UPI record vs Constant	Reference Rate	EUR-EURIBOR-Reuters vs Basket
		Basket	Single Underlier	Other Leg Reference Rate	Constant vs UPI record	Other Leg Reference Rate	Basket vs EUR-EURIBOR-Reuters
		Single Underlier	-	Reference Rate	UPI record	Reference Rate	EUR-EURIBOR-Reuters
		Single Underlier	-	Underlying ISIN	ISIN Reference Data	longName of Underlying Instrument ISIN	
						• ISIN is found in ISIN Reference Data.	VODAFONE GROUP PLC
						• ISIN is found in ISIN Reference Data, but its description is missing.	No name available
						• ISIN is not found in ISIN Reference Data.	No name obtainable
		Basket	-	N/A	Constant	N/A	Basket
	Equity	Single Underlier	-	Underlying ISIN	ISIN Reference Data	longName of Underlying Instrument ISIN	
						• ISIN is found in ISIN Reference Data.	MICROSOFT CORPORATION
						• ISIN is found in ISIN Reference Data, but its description is missing.	No name available
						• ISIN is not found in ISIN Reference Data.	No name obtainable
				Underlying Index	UPI record	Underlying Instrument Index	MSCI EM USD

				Underlying Index Prop	UPI record	Underlying Instrument Index Prop	11339-19100188998
		Basket	-	N/A	Constant	N/A	Basket
	Credit	Single Underlier	-	Underlying ISIN	ISIN Reference Data	longName of Underlying Instrument ISIN	
						• ISIN is found in ISIN Reference Data.	VODAFONE GROUP PLC
						• ISIN is found in ISIN Reference Data, but its description is missing.	No name available
						• ISIN is not found in ISIN Reference Data.	No name obtainable
				Underlying Index	UPI record	Underlying Instrument Index	CMBX.NA.AA
				Underlying Index Prop	UPI record	Underlying Instrument Index Prop	11339-19100280752
				Underlying LEI	LEI Reference Data	The name of the legal entity	
						• LEI is found in LEI Reference Data.	MICROSOFT CORPORATION
						• LEI is found in LEI Reference Data, but its legal name is missing.	No name available
						• LEI is not found in LEI Reference Data.	No name obtainable
		Basket	-	N/A	Constant	N/A	Basket
	Foreign Exchange	-	-	Notional Currency / Other Notional Currency	UPI record	Notional Currency / Other Notional Currency	GBP USD
	Commodities	Single Underlier	Single Underlier	Reference Rate / Other Reference Rate	UPI record	Reference Rate vs Other Reference Rate	OIL-JCC-DETAILED vs BRENT/BFOEOIL-BRENT/BFOE-ICE
		Basket	Basket	N/A	Constant	N/A	Basket vs Basket

		Single Underlier	Basket	Reference Rate	UPI record vs Constant	Reference Rate vs Basket	OIL-JCC-DETAILED vs Basket
		Basket	Single Underlier	N/A / Other Reference Rate	Constant vs UPI record	Other Reference Rate	Basket vs BRENT/BFOEOIL-BRENT/BFOE-ICE

6 Appendix – Underlier ID Validation

The table below illustrates the Underlier ID Source values (i.e., EQIDX, FPML, etc.) and validation types based on the selected underlier types where applicable.

				Currency	*Equity Index Name*	*Floating Rate Index*	*Inflation Rate Index*	*Commodity Index*	*Commodity Ref Price*	*Fixed Income Security*	*Single Stock*	*Equity Index dentifier*	*Fixed Income Security*	*Single Stock*	*Equity Identifier*	*Legal Entity*	*Credit Index*	*Proprietary Index*	*UPI*
Asset Class	Instrument Type	Product	Validation Type	CCY	EQIDX	FPML		COIDX	COMM	ISIN			[RIC; FIGI; CUSIIP; SEDOL]			LEI	CRIDX	PROP	UPI
CMD	FWD	Single_Index	Enum					✓										✓	
CMD	FWD	Forward	Enum					✓	✓										
CMD	FWD	Multi_Exotic_Forward	N/A [Basket]																
CMD	FWD	Non_Standard	Enum					✓	✓									✓	
CMD	OPT	Option	Enum						✓										
CMD	OPT	Multi_Exotic_Option	N/A [Basket]																
CMD	OPT	Single_Index	Enum					✓	✓									✓	
CMD	OPT	Swaption	Synt, Clas, RDL																✓
CMD	OPT	Non_Standard	Enum					✓	✓									✓	
CMD	SWP	Single_Index	Enum					✓										✓	
CMD	SWP	Basis_Swap	Enum						✓										
CMD	SWP	Multi_Exotic_Swap	N/A [Basket]																
CMD	SWP	Swap	Enum						✓										
CMD	SWP	Non_Standard	Enum					✓	✓									✓	
CRD	FWD	Debt	Synt, Prefx							✓									
			Mapp										✓						
CRD	FWD	Non_Standard	Synt, Prefx							✓									
			Mapp										✓						
CRD	OPT	Index_Swaption	Synt, Clas, RDL																✓
CRD	OPT	Single_Name_Swaption	Synt, Clas, RDL																✓
CRD	OPT	Non_Standard	Enum														✓	✓	
			Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
CRD	SWP	ABS	Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
CRD	SWP	Corporate	Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
CRD	SWP	Index	Enum														✓	✓	
CRD	SWP	Index_Tranche	Enum														✓	✓	

Asset Class	Instrument Type	Product	Validation Type	Currency	Equity Index Name	Floating Rate Index	Inflation Rate Index	Commodity Index	Commodity Ref Price	Fixed Income Security	Single Stock	Equity Index dentifier	Fixed Income Security	Single Stock	Equity Identifier	Legal Entity	Credit Index	Proprietary Index	UPI
				CCY	EQIDX	FPML		COIDX	COMM	ISIN			[RIC; FIGI; CUSIIP; SEDOL]			LEI	CRIDX	PROP	UPI
CRD	SWP	Loan	Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
CRD	SWP	Municipal	Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
CRD	SWP	Sovereign	Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
CRD	SWP	Total_Return_Swap	Enum														✓	✓	
			Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
CRD	SWP	Non_Standard	Enum														✓	✓	
			Synt, Prefx							✓									
			Synt													✓			
			Mapp										✓						
EQT	SWP	Price_Return_Basic_Performance_Single_Name	Synt, Prefx								✓								
			Mapp											✓					
EQT	SWP	Price_Return_Basic_Performance_Single_Index	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	SWP	Parameter_Return_Dividend_Single_Index	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	SWP	Parameter_Return_Dividend_Single_Name	Synt, Prefx								✓								
			Mapp											✓					
EQT	SWP	Parameter_Return_Dividend_Basket	N/A [Basket]																
EQT	SWP	Parameter_Return_Variance_Single_Name	Synt, Prefx								✓								
			Mapp											✓					
EQT	SWP	Parameter_Return_Variance_Basket	N/A [Basket]																
EQT	SWP	Parameter_Return_Volatility_Single_Name	Synt, Prefx								✓								
			Mapp											✓					
EQT	SWP	Parameter_Return_Volatility_Basket	N/A [Basket]																

				Currency	Equity Index Name	Floating Rate Index	Inflation Rate Index	Commodity Index	Commodity Ref Price	Fixed Income Security	Single Stock	Equity Index dentifier	Fixed Income Security	Single Stock	Equity Identifier	Legal Entity	Credit Index	Proprietary Index	UPI
Asset Class	Instrument Type	Product	Validation Type	CCY	EQIDX	FPML		COIDX	COMM	ISIN			[RIC; FIGI; CUSIIP; SEDOL]			LEI	CRIDX	PROP	UPI
EQT	SWP	Parameter_Return_Variance_Single_Index	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	SWP	Price_Return_Basic_Performance_Single_Name_CFD	Synt, Prefx								✓								
			Mapp											✓					
EQT	SWP	Price_Return_Basic_Performance_Basket	N/A [Basket]																
EQT	SWP	Price_Return_Basic_Performance_Basket_CFD	N/A [Basket]																
EQT	SWP	Price_Return_Basic_Performance_Single_Index_CFD	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	SWP	Parameter_Return_Volatility_Single_Index	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	SWP	Portfolio_Swap_Single_Index	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	SWP	Portfolio_Swap_Single_Name	Synt, Prefx								✓								
			Mapp											✓					
EQT	SWP	Portfolio_Swap	N/A [Basket]																
EQT	SWP	Portfolio_Swap_Other	Synt, Prefx								✓								
			Mapp											✓					
EQT	SWP	Non_Standard	Enum		✓													✓	
			Synt, Prefx								✓	✓							
			Mapp											✓					
EQT	FWD	Price_Return_Basic_Performance_Single_Index_CFD	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	FWD	Price_Return_Basic_Performance_Single_Index	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	FWD	Price_Return_Basic_Performance_Single_Name	Synt, Prefx								✓								
			Mapp											✓					
EQT	FWD	Price_Return_Basic_Performance_Single_Name_CFD	Synt, Prefx								✓								
			Mapp											✓					
EQT	FWD	Price_Return_Basic_Performance_Basket_CFD	N/A [Basket]																
EQT	FWD	Price_Return_Basic_Performance_Basket	N/A [Basket]																
EQT	FWD	Non_Standard	Enum		✓													✓	
			Synt, Prefx								✓	✓							
			Mapp											✓					
EQT	OPT	Single_Name	Synt, Prefx								✓								
			Mapp											✓					
EQT	OPT	Single_Index	Enum		✓													✓	
			Synt, Prefx									✓							
EQT	OPT	Basket	N/A [Basket]																

				Currency	*Equity Index Name*	*Floating Rate Index*	*Inflation Rate Index*	*Commodity Index*	*Commodity Ref Price*	*Fixed Income Security*	*Single Stock*	*Equity Index dentifier*	*Fixed Income Security*	*Single Stock*	*Equity Identifier*	*Legal Entity*	*Credit Index*	*Proprietary Index*	*UPI*
Asset Class	Instrument Type	Product	Validation Type	CCY	EQIDX	FPML		COIDX	COMM	ISIN			[RIC; FIGI; CUSIP; SEDOL]			LEI	CRIDX	PROP	UPI
EQT	OPT	Non_Standard	Enum		✓													✓	
			Synt, Prefx								✓	✓							
			Mapp											✓					
FRX	FWD	NDF	Enum	✓															
FRX	FWD	Forward	Enum	✓															
FRX	FWD	Vol_Var	Enum	✓															
FRX	FWD	Rollng_Spot	Enum	✓															
FRX	FWD	Contract_For_Difference	Enum	✓															
FRX	FWD	Spreadbet	Enum	✓															
FRX	FWD	Non_Standard	Enum	✓															
FRX	OPT	NDO	Enum	✓															
FRX	OPT	Digital_Option	Enum	✓															
FRX	OPT	Barrier_Option	Enum	✓															
FRX	OPT	Vanilla_Option	Enum	✓															
FRX	OPT	Forward_Vol_Agreement	Enum	✓															
FRX	OPT	Target_Option	Enum	✓															
FRX	OPT	Non_Standard	Enum	✓															
FRX	SWP	FX_Swap	Enum	✓															
FRX	SWP	FX_Swap_NDS	Enum	✓															
RTS	OPT	CapFloor	Enum			✓													
RTS	OPT	Debt_Option	Synt, Prefx							✓									
			Mapp										✓						
RTS	OPT	Inflation_CapFloor	Enum				✓												
RTS	OPT	Swaption	Synt, Clas, RDL																✓
RTS	OPT	Non_Standard	Enum			✓	✓												
RTS	FWD	Debt	Synt, Prefx							✓									
			Mapp										✓						
RTS	FWD	FRA_Index	Enum			✓													
RTS	FWD	FRA_Other	Synt, Prefx							✓									
			Mapp										✓						

				Currency	*Equity Index Name*	*Floating Rate Index*	*Inflation Rate Index*	*Commodity Index*	*Commodity Ref Price*	*Fixed Income Security*	*Single Stock*	*Equity Index dentifier*	*Fixed Income Security*	*Single Stock*	*Equity Identifier*	*Legal Entity*	*Credit Index*	*Proprietary Index*	*UPI*
Asset Class	Instrument Type	Product	Validation Type	CCY	EQIDX	FPML		COIDX	COMM	ISIN			[RIC; FIGI; CUSIIP; SEDOL]			LEI	CRIDX	PROP	UPI
RTS	SWP	Fixed_Fixed	N/A																
RTS	SWP	Fixed_Float	Enum			✓													
RTS	SWP	Fixed_Float_Zero_Coupon	Enum			✓													
RTS	SWP	Fixed_Float_OIS	Enum			✓													
RTS	SWP	Cross_Currency_Zero_Coupon	Enum			✓													
RTS	SWP	Cross_Currency_Fixed_Fixed	N/A																
RTS	SWP	Cross_Currency_Fixed_Float	Enum			✓													
RTS	SWP	Cross_Currency_Fixed_Float_NDS	Enum			✓													
RTS	SWP	Basis	Enum			✓													
RTS	SWP	Inflation_Fixed_Float_Zero_Coupon	Enum				✓												
RTS	SWP	Inflation_Swap	Enum				✓												
RTS	SWP	Inflation_Fixed_Float_YoY	Enum				✓												
RTS	SWP	Cross_Currency_Inflation_Swap	Enum				✓												
RTS	SWP	Inflation_Basis_YoY	Enum				✓												
RTS	SWP	Inflation_Basis_Zero_Coupon	Enum				✓												
RTS	SWP	Inflation_Basis	Enum			✓	✓												
RTS	SWP	Basis_OIS	Enum			✓													
RTS	SWP	Cross_Currency_Basis	Enum			✓													
RTS	SWP	Non_Standard	Enum			✓	✓												
OTH	FWD	Non_Standard	Enum	✓	✓	✓	✓	✓	✓									✓	
			Synt, Prefx							✓	✓	✓							
			Mapp										✓		✓				
OTH	OPT	Non_Standard	Enum	✓	✓	✓	✓	✓	✓								✓	✓	
			Synt, Prefx							✓	✓	✓							
			Synt													✓			
			Mapp										✓		✓				
OTH	SWP	Non_Standard	Enum	✓	✓	✓	✓	✓	✓								✓	✓	
			Synt, Prefx							✓	✓	✓							
			Synt													✓			
			Mapp										✓		✓				
OTH	OTH	Non_Standard	Enum	✓	✓	✓	✓	✓	✓								✓	✓	
			Synt, Prefx							✓	✓	✓							
			Synt													✓			
			Mapp										✓		✓				