DERIVATIVES SERVICE BUREAU (DSB) LTD

UPI & OTC ISIN Product Validation

Version 1

Change History

Date	Status	Version	Revision Details
18 Oct 2023	Draft	1	Initial Version

Contents

1. Introduction

This document provides the user with the validation rules where applicable based on the Product Definition for UPI & OTC ISIN Services.

This document covers the validation of underlier and attribute values within the UPI & OTC ISIN Services.

1.1 Associated Documentation

The reference documents below contain values and information maintained by the DSB for consistency and ease of access.

These documents are made available on the ANNA DSB website (Product Definitions page):

<table>
<tr><th>Title</th><th>Description</th><th>Location</th></tr>
<tr><td>Product Definition Documents</td><td>Provides the user with the detailed description of the UPI and OTC ISIN Product Definition content such as attribute enumerations, validation, normalization, and derivation where applicable</td><td>Rates, Credit, Equity, Foreign Exchange, Commodities, Non-Standard sections</td></tr>
<tr><td>Enumerations Document</td><td>Lists all fixed values used for a product</td><td>Enumerations section</td></tr>
<tr><td>Product Definition Validations and Normalizations Document</td><td>Specifies details on validation and normalization rules</td><td rowspan="4">Other Documents section</td></tr>
<tr><td>UPI Underlier Input Method</td><td>Defines the structure for the input of the underlier following the rules that allow users to identify the Asset Class, Underlying Structure, Underlying Type, and Underlying ID Source.</td></tr>
<tr><td>Best Practice Guidelines and FAQs</td><td>Lists answers to queries raised by users and provides guidance on the use of the templates</td></tr>
<tr><td>GitHub Environment Section</td><td>ANNA DSB Github Environment where the JSON templates for each product is found</td></tr>
</table>

Underlier Validation				
OTC ISIN	**UPI**		**Asset Class(es)**	**Description**
Underlying Attribute	**Underlier ID Source**	**Underlier Type**		
Notional Currency / Other Notional Currency	CCY	Currency	FX	Enumeration Validation
Reference Rate / Other Reference Rate	COMM	Commodity Ref Price	CO	Enumeration Validation
	FPML	Floating Rate Index / Inflation Rate Index	RT	Enumeration Validation
Underlying Instrument Index	COIDX	Commodity Index	CO	Enumeration Validation
	CRIDX	Credit Index	CR	Enumeration Validation
	EQIDX	Equity Index Name	EQ	Enumeration Validation
Underlying Instrument Index Prop	PROP	Proprietary Index	RT, CR, EQ, CO	RDL and Classification Validation
Instrument ISIN / Underlying Instrument ISIN	ISIN	Single Stock, Fixed Income Security, Equity Index, Swaption Underlier	RT, EQ, CR	Syntactic, Prefix Validation
Instrument LEI / Underlying Instrument LEI	LEI	Legal Entity	CR	Syntactic Validation
N/A	CUSIP, FIGI, SEDOL	Single Stock, Fixed Income Security, Equity Index	RT, EQ, CR	Mapping Validation
	UPI	Swaption Underlier	RT, CR, CO	Syntactic, Classification and RDL Validation
Other Attribute Validation				
Contract Specification			CR	Classification Validation
Commodity Classification			CO	Classification Validation

Debt Seniority	CR	Classification Validation
Index Series and Version	CR	Numeric Validation
Notional Currency / Other Notional Currency	RT, FX	Identical Validation
Option Exercise Style / Option Type	RT, CR, EQ, CO, FX	Enumeration Validation
Reference Rate Term Value / Unit	RT	Numeric Validation
Settlement Currency	FX	Classification Validation
Underlying Instrument Index Term Value / Unit	RT, CR	Numeric Validation

2. General Validation

2.1 Introduction

This section specifies the general validation for the required attributes within the UPI & OTC ISIN Services.

2.2 Underlier Validation

This section specifies the underlier validation based on the selected underlier types.

Asset Class	OTC ISIN	UPI		Validation Type	Validation	Link	Error Message	
	Underlying Instrument	Underlier Type	Underlier ID Source				OTC ISIN	UPI
FX	Notional Currency / Other Notional Currency	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])".*	
CO	Reference Rate / Other Reference Rate	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])".*	
RT	Reference Rate / Other Leg Reference Rate [Floating Rate Index]	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])".*	
RT	Reference Rate / Other Leg Reference Rate [Inflation Index]	Inflation 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])".*	
RT	Combined Floating Rate Index and Inflation Index	Combined Floating Rate Index and Inflation 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])".*	

CO	Underlying Instrument Index	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])".*
CR	Underlying Instrument Index	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])".*
EQ	Underlying Instrument Index	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 OTC ISIN / UPI Record.	See Enumeration Document	*"Error: Underlying Instrument Index: instance value (X) not found in enum (possible values: [X])".*
CO, CR, EQ, RT	Underlying Instrument Index Prop	Proprietary Index	PROP	RDL and Classification Validation	• The input PROP must exist in the DSB Proprietary Index Enumeration that is 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".*
CR, EQ, RT	Underlying Instrument ISIN	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.	N/A	*"Error: ISIN/s must be valid."*

					○ 1st 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.		
		[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. ○ 1st 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	N/A	*"Error: ISIN/s must be valid."*

					is listed in the RA list of ISIN prefixes. • For multi-assets, Equity Identifier is used as underlier type where user is able to enter an ISIN of a single stock of an ISIN of an Equity Index.		

CR	Instrument LEI / Underlying Instrument LEI	Legal	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})$."*

2.3 Basis Style Underlier Validation

This section specifies the validation of underlier combination for basis style products.

Asset Class	OTC ISIN		UPI				Validation Type	Validation	Link	Error Message	
	Underlying Instrument	Other Underlying Instrument	Underlier Type	Underlier ID Source	Other Underlier Type	Other Underlier ID Source				OTC ISIN	UPI
CO	Reference Rate	Other Reference Rate	Referen ce Rate	COMM	Other Reference Rate	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])".*	
							Underlier Type Validation	If Reference Rate and Other Reference Rate is selected but Other Reference Rate's associated attributes (Other Base Product, Other Sub Product, Other Additional Sub Product) are not selected.	N/A	*"Must have property OtherBaseProduct"*	
	Reference Rate	No Input	Referen ce Rate	COMM	No Input	No Input	Underlier Type Validation	If Reference Rate is selected but Other Reference Rate is not selected.	N/A	*"Error: Other Reference Rate is required".*	
								If Reference Rate is selected but Other Reference Rate is not selected, and its associated attributes (Other Base Product, Other Sub Product, Other Additional Sub Product) are selected.	N/A	*"Must have property OtherUnderlying"*	

	Reference Rate	Multiple Other Reference Rates	Reference Rate	COMM	Basket	N/A	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])".*
	Multiple Reference Rates	Other Reference Rate	Basket	N/A	Other Reference Rate	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])".*
	Multiple Reference Rates	Multiple Other Reference Rates	Basket	N/A	Basket	N/A	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])".*
RT	Reference Rate	Other Leg Reference Rate	Reference Rate	FPML	Other Leg Reference 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])"*
	Reference Rate	Multiple Other Leg Reference Rates	Reference Rate	FPML	Basket	N/A	Enumeration Validation	For both legs, 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])"*
	Multiple Reference Rates	Other Leg Reference Rate	Basket	N/A	Other Leg Reference Rate	FPML	Enumeration Validation	For both legs, 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])"*
	Multiple Reference Rates	Multiple Other Leg Reference Rate	Basket	N/A	Basket	N/A	Enumeration Validation	For both legs, 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])"*

2.4 Contract Specification

- Contract Specification enumerated values are based on the FpML Matrix Term Scheme and are filtered to support the appropriate entries for the selected Single Name CDS product. For example: Credit.Swap.Corporate will allow only Corporate Contract Specifications. The table below shows the example enumerated value of Contract Specification for each Single Name CDS Product selected.

Attribute	Single Name CDS Product	Example Enumerated Value
Contract Specification	Credit.Swap.Corporate	NorthAmericanCorporate
		StandardNorthAmericanCorporate
		StandardNorthAmericanFinancialCorporate
	Credit.Swap.Municipal	StandardUSMunicipalRevenue
		USMunicipalRevenue
	Credit.Swap.Sovereign	StandardWesternEuropeanSovereign
		WesternEuropeanSovereign

- For Credit.Swap.Non_Standard, the supported enumerated values for Contract Specification are dependent on the Underlying Issue Type selected (Corporate, Sovereign, or Local).
- The selection of the Underlying Issuer Type will determine the valid input values for the Contract Specification attribute in the following way:

Attribute	Single Name CDS Product	Underlying Issuer Type	Example Enumerated Value
Contract Specification	Credit.Swap.Non_Standard	Corporate	NorthAmericanCorporate
			StandardNorthAmericanCorporate
			StandardNorthAmericanFinancialCorporate
		Local	StandardUSMunicipalRevenue
			USMunicipalRevenue
		Sovereign	StandardWesternEuropeanSovereign
			WesternEuropeanSovereign

- Contract Specification is not supported in the specifications of the following Credit products i.e., Index, Index Tranche, Loan, ABS, Total Return Swap.

2.5 New ISO 4217 Currency Code Validation

The below table represents a list of currency codes where a minimum acceptable expiry date will be applied for a newly introduced currency code to the ISO 4217 currency code list. The minimum expiry date will typically match the first date on which the currency code is made available.

The validations in the below table impact the following fields in the DSB product definition templates:

- Notional Currency
- Other Notional Currency
- Settlement Currency
- Strike Price Currency

Currency Code	Available Date	Minimum Expiry Date	Error Message
STN	30th June 2018	30th June 2018	*"Error: The given currency 'STN' is only available for instruments with Expiry Date of 2018-06-30 and onwards".*
MRU	30th June 2018	30th June 2018	*"Error: The given currency 'MRU' is only available for instruments with Expiry Date of 2018-06-30 and onwards".*
VES	20th August 2018	20th August 2018	*"Error: The given currency 'VES' is only available for instruments with Expiry Date of 2018-08-20 and onwards".*

2.6 Other Attributes Validation

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

Asset Class	Attribute	Validation Type	Validation	Error Message	
				GUI	API
CO	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, attribute(s) will be removed.	*N/A*	
			• If Base Product is selected and has no input value.	*N/A*	*"/Attributes: object has missing required properties ([\"BaseProduct\"])"*.
CR	Debt Seniority	Classification Validation	• Debt Seniority must be one of (SNDB, MZZD, SBOD, JUND) if Underlying Instrument ISIN/LEI is selected. • Debt Seniority cannot be one of (SNDB, MZZD, SBOD, JUND) if Underlying Instrument Index is selected.	*"Debt Seniority must be one of (SNDB, MZZD, SBOD, JUND) if Underlying Instrument ISIN/LEI is selected".*	
FX, RT	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 have no Place of Settlement attribute.	*"Error: Notional Currency and Other Notional Currency cannot be identical."*	

			Exception below: *The input Notional Currency and Other Notional Currency are both CNY and has Place of Settlement = "Hong Kong".*	
CO, CR, EQ, FX, RT	Option Exercise Style	Enumeration Validation	Option Exercise Style must be one of (AMER, BERM, EURO).	*"Must have property OptionType."*
			• If Option Exercise Style is selected and Option Type is not selected.	
CO, CR, EQ, FX, RT	Option Type	Enumeration Validation	Option Type must be one of (CALL, PUTO, OPTL).	*"Must have property OptionExerciseStyle."*
			• If Option Type is selected and Option Exercise Style is not selected. *Exception below:* *For Rates Options products such as CapFloor, Debt_Option, Inflation_CapFloor where Option Exercise Style is derived as fixed value (EURO).*	
FX	Settlement Currency	Identification Validation	• Settlement Currency is required if the input Notional Currency and Other Notional Currency are both CNY and Place of Settlement = "Hong Kong".	*"Error: Notional Currency and Other Notional Currency cannot be identical."*
			• 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".*
RT	Reference Rate Term Value / Other Leg	Numeric Validation	The input text must be an integer from -999 to 999 (excluding 0) with the exception for multi-asset / non-standard product definitions where there is more than 1 Reference Rates.	*N/A*

	Reference Rate Term Value		• If the input text is less than -999.	*"Value must be at least -999."*	*"/Attributes/ReferenceRateTermValue: numeric instance is lower than the required minimum (minimum: -999, found: XXX)".*
			• If the input text is greater than 999.	*"Value must be at most 999."*	*"/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.	*"Value must not validate against the provided schema. Value can't be 0."*	*"/Attributes/ReferenceRateTermValue: instance type (string) does not match any allowed primitive type (allowed: [\"integer\"])".*
			• If the input text is 0.	*"/Attributes: instance failed to match exactly one schema (matched o out of X)".*	*"/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 is a Reference Rate where enumerated values are [DAYS, WEEK, MNTH, YEAR]. • If the selected underlier is a Reference Rate and Reference Rate Term Unit has no input value.	*N/A*	*"Must have property ReferenceRateTermUnit"*
CR	Underlying Instrument Index Term Value	Numeric Validation	• If the selected underlying is a Credit Index, the input text must be an integer from -999 to 999 (excluding 0) with exception for multi-asset / non-standard product definitions where there is more than 1 Underlying Instrument Indices. • If the selected underlying is an Index Prop, the input text must be an integer from -999 to 999 (including 0).	*N/A*	
			• If the selected underlying is a Credit Index or Index Prop and Underlying Instrument Index Term Value has no input value.	*N/A*	*"Must have property UnderlyingInstrumentIndexTermValue"*
			• If the selected underlying is a Credit Index where the input text is 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 is a Credit Index or Index Prop where enumerated values are [DAYS, WEEK, MNTH, YEAR]. • If the Underlying Instrument Index Term Unit has no input value.	*N/A*	*"Must have property UnderlyingInstrumentIndexTermUnit"*
CR	Underlying Credit Index Series / Index Version	Numeric Validation	If the selected underlier is a Credit Index, the input text must be an integer from 1 to 999.	*N/A*	
			• If Underlying Credit Index Series / Index Version have no input values.	*N/A*	*"Must have property UnderlyingCreditIndexSeries"* *"Must have property UnderlyingCreditIndexVersion"*
			• If the input text is 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 input text is less than 0.	*"Value must be at least 0."*	
			• 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 0".*	

			If the selected underlier is an Index Prop, the input text must be an integer from 0 to 999.	*N/A*	
			• If Underlying Credit Index Series / Index Version have no input values.	*N/A*	*"Must have property UnderlyingCreditIndexSeries"* *"Must have property UnderlyingCreditIndexVersion"*
			• If the input text is less than 0.	*"Value must be at least 0."*	
			• 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 0".*	

3. UPI Specific Validation

3.1 Introduction

This section specifies the validation for the required attributes within the UPI Service and does not apply to OTC ISIN Service.

3.2 Underlier ID Source Selection

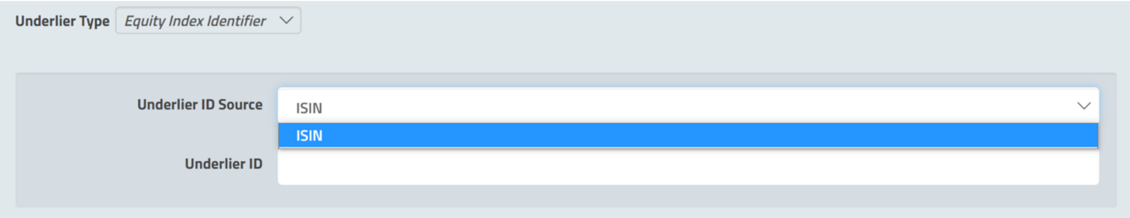
This section specifies the process where Primary and Alternative Underlier IDs are supported based on the selected product.

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;

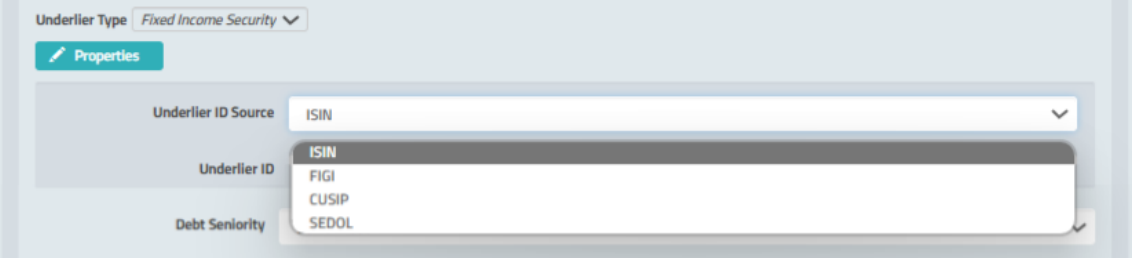
- Primary Underlier ID Source → ISIN
- Alternative Underlier ID Source(s) → [FIGI; CUSIP; SEDOL]

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 i.e., ISIN.



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

3.3 Alternate Underlier ID Validation

This section specifies the Alternate Underlier ID validation based on the selected underlier types.

Underlier Type	Underlier ID Source	Validation Type	Validation	Link	Error Message
[Equity Identifier, Fixed Income Security, Single Stock]	[CUSIP, FIGI, SEDOL]	Mapping Validation	• Where a 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., CUSIP, FIGI, 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 a 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|SEDOL] as an input Underlier ID Source".*
			• When a 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|SEDOL] as an input ReturnUnderlier ID Source".*

3.4 Underlier Validation for Swaption

This section specifies the underlier validation for UPI Swaption products.

<table>
<tr><th>Underlier Type</th><th>Underlier ID Source</th><th>Validation Type</th><th>Validation</th><th>Link</th><th>Error Message</th></tr>
<tr><td rowspan="4">UPI</td><td rowspan="4">UPI</td><td rowspan="2">Syntactic, Classification and RDL Validation</td><td>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”.</td><td rowspan="2">N/A</td><td>“Value must match the pattern ^QZ([0-9BCDFGHJ-NPQ-TVWXZ]){10}$”.</td></tr>
<tr><td>The input UPI is not valid and does not exist in UPI RDL.</td><td>“Error: Underlier ID [UPI] not found”.</td></tr>
<tr><td rowspan="2">Specific Product Validation</td><td>Product: Rates.Option.Swaption

The underlier UPI record returned from the UPI RDL must meet the following criteria:
○ Asset Class: “Rates”
○ Instrument Type: “Swap”
○ Status: not = “Deleted”</td><td rowspan="2">N/A</td><td>“Error: Underlier ID [UPI] must be a valid and existing Rates Swap”.</td></tr>
<tr><td>Product: Credit.Option.Index_Swaption

The underlier UPI record returned from the UPI RDL must meet the following criteria:
○ Asset Class: “Credit”</td><td>“Error: Underlier ID [UPI] must be a valid and existing Credit Swap”.</td></tr>
</table>

			○ Instrument Type: “Swap” ○ Underlying Asset Type: “Index” or “Index Tranche” ○ Status: not = “Deleted”		
			Product: Credit.Option.Single_Name_Swaption The underlier UPI record returned from the UPI RDL must meet the following criteria: ○ Asset Class: “Credit” ○ Instrument Type: “Swap” ○ Underlying Asset Type: “Single Name” or “Other” ○ Status: not = “Deleted”		*“Error: Underlier ID [UPI] must be a valid and existing Credit Swap”.*
			Product: Commodities.Option.Swaption The underlier UPI record returned from the UPI RDL must meet the following criteria: ○ Asset Class: “Commodities” ○ Instrument Type: “Swap” ○ Status: not = “Deleted”		*“Error: Underlier ID [UPI] must be a valid and existing Commodities Swap”.*

4. OTC ISIN Specific Validation

4.1 Introduction

This section specifies the validation for the required attributes within the OTC ISIN Service and does not apply to UPI Service.

4.2 General Validation

This section specifies the general validation rules for the following attributes:

Attribute Name	Error Message
Expiry Date	• Expiry Date must be in the "YYYY-MM-DD" format. • Expiry Date cannot be less than "1970-01-01". • Expiry Date cannot be greater than "9999-12-31".
Price Multiplier	• Price Multiplier must be greater than 0. • Input values greater than 99999999999999999 may be subject to rounding.
Strike Price	• Input values accept both positive and negative numbers. Values are rounded-off and not truncated. • If input value exceeds maximum: • StrikePrice: numeric instance is greater than the required maximum.
Term of Contract Value	• Term of Contract Value cannot be less than -999. • Term of Contract Value cannot be greater than 999. • Term of Contract Value must not be 0.

4.3 Attribute Arrays

The following attributes allow for multiple values to be input when they are part of OTC ISIN Product Definitions that require multiple underliers:

- Reference Rate
- Underlying Instrument Index
- Underlying Instrument ISIN

Asset Class	Instrument Type	Product Definitions
Equity	Swap	Price_Return_Basic_Performance_Basket
Equity	Swap	Parameter_Return_Dividend_Basket
Equity	Swap	Parameter_Return_Variance_Basket
Equity	Swap	Parameter_Return_Volatility_Basket
Equity	Swap	Price_Return_Basic_Performance_Basket_CFD
Equity	Swap	Portfolio_Swap
Equity	Forward	Price_Return_Basic_Performance_Basket_CFD
Equity	Forward	Price_Return_Basic_Performance_Basket
Equity	Option	Basket
Commodities	Swap	Multi_Exotic_Swap
Credit	Forward	Non_Standard
Commodities	Forward	Multi_Exotic_Forward
Commodities	Option	Multi_Exotic_Option

Commodities	Swap	Non_Standard
Commodities	Forward	Non_Standard
Commodities	Option	Non_Standard
Rates	Forward	Debt
Other	Swap	Non_Standard
Other	Forward	Non_Standard
Other	Option	Non_Standard
Other	Other	Non_Standard

4.4 Equity Option Strike Price Validation

- For Equity Option Basket/Single Index/Single Name:

Strike Price value is validated depending on the Strike Price Type:

  - DECIMAL - 18,13 if the price is expressed as monetary value.
  - DECIMAL - 11,10 if the price is expressed as percentage.
  - DECIMAL - 11,10 if the price is expressed as yield.
  - DECIMAL - 18,17 if the price is expressed as basis points.

Strike Price Currency is derived when Strike Price Type is set to 'Monetary Value'. For other price types, Strike Price Currency must not be present on the ISIN record.

- For Equity Option Non-Standard, Cross-Asset Option and Cross-Asset Other:

Strike Price value is validated depending on the Strike Price Type:

  - DECIMAL - 18,13 if the price is expressed as monetary value.
  - DECIMAL - 11,10 if the price is expressed as percentage.
  - DECIMAL - 11,10 if the price is expressed as yield.
  - DECIMAL - 18,17 if the price is expressed as basis points.
  - For 'No Price' - 'Strike Price' must be 'PNDG'.

Strike Price Currency is available for an input when Strike Price Type is set to 'Monetary Value' OR 'PNDG' and is not available for an input when Strike Price Type is set to 'Percentage', 'Yield' OR 'Basis Points'.

- For Equity Option Non-Standard: If Strike Price Currency is not provided by the user and Strike Price Type is set to 'Monetary Value', 'Strike Price Currency' is derived from 'Notional Currency'.

- For Cross-Asset Option and Cross-Asset Other: 'Strike Price Currency' is a mandatory user input if Strike Price Type is set to 'Monetary Value'.

4.5 Rates CAPFLOOR – Underlying Instrument Index

For the Rates CapFloor template, Underlying Instrument Index references the same list of enumerations as 'Reference Rate' and 'Other Leg Reference Rate'.

The below table represents a list of Underlying Instrument Index values used in the Rates CapFloor template, where a minimum acceptable expiry date will be applied for newly created reference rates. The minimum expiry date will typically match the first date on which the reference rate is made available.

Reference Rate	Available Date	Minimum Expiry Date	Error Message
GBP-SONIA-COMPOUND	23rd April 2018	23rd April 2018	*"Error: This reference rate is invalid for the given expiry date".*
USD-SOFR-COMPOUND	3rd April 2018	3rd April 2018	*"Error: This reference rate is invalid for the given expiry date".*

4.6 Term of Contract Value and Unit

All OTC Derivative Products that have an Interest Rate as an underlying are required to include a Term Of Contract within their definition. In order to support this, the relevant Rates and Cross-Asset templates have an integrated Tenor Calculator that is used when a Standard Tenor is not available.

In this case, the user is able to supply an Effective Date and Expiry Date and the system will then calculate the Term of Contract Value and Unit which are then used in the definition of the ISIN.

Details of the calculation method used can be found in the [DSB Tenor Calculation Specification document](#).

4.7 Underlier Validation for Swaption

This section specifies the underlier validation for the OTC ISIN Swaption products.

Underlying Instrument	Validation Type	Validation	Link	Error Message
Underlying Instrument ISIN	Syntactic, Classification and RDL Validation	The input ISIN 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 "EZ"	N/A	*"Value must match the pattern ^EZ([0-9BCDFGHJ-NPQ-TVWXZ]){10}$".*
		The input ISIN is not valid and does not exist in UPI RDL.		*"Error: ISIN/s not found".*
	Specific Product Validation	Product: Rates.Option.Swaption The Underlying Instrument ISIN record returned from the ISIN RDL must meet the following criteria: ○ Asset Class: "Rates" ○ Instrument Type: "Swap" ○ Status: not = "Deleted"	N/A	*"Error: Underlying Instrument ISIN must be a valid and existing Rates Swap".*
		Product: Credit.Option.Index_Swaption The Underlying Instrument ISIN record returned from the ISIN RDL must meet the following criteria: ○ Asset Class: "Credit" ○ Instrument Type: "Swap"		*"Error: Underlying Instrument ISIN must be a valid and existing Credit Swap".*

		○ Underlying Asset Type: “Index” or “Index Tranche” ○ Status: not = “Deleted”		
		Product: Credit.Option.Single_Name_Swaption The Underlying Instrument ISIN record returned from the ISIN RDL must meet the following criteria: ○ Asset Class: “Credit” ○ Instrument Type: “Swap” ○ Underlying Asset Type: “Single Name” or “Other” ○ Status: not = “Deleted”		*“Error: Underlying Instrument ISIN must be a valid and existing Credit Swap”.*
		Product: Commodities.Option.Swaption The Underlying Instrument ISIN record returned from the ISIN RDL must meet the following criteria: ○ Asset Class: “Commodities” ○ Instrument Type: “Swap” ○ Status: not = “Deleted”		*“Error: Underlying Instrument ISIN must be a valid and existing Commodities Swap”.*

5. Appendix – Underlier ID Validation

The table below listed all the product definition templates based on underlier types and sources.

				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			[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	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														✓	✓	

				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			[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			[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			[FIGI; CUSIIP; 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			[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										✓		✓				
OTH	OTH	Undefined	N/A																