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| Margin Period of Risk |
| Functional Specification Document |
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| Document Information |

*Change History of Template*

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| *Version* | *Changes* |
| *1.0* | *Initial Version* |

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**Change History**

|  |  |  |  |
| --- | --- | --- | --- |
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| 1.1 | 17th April 2020 | Kavita Surve and Mohammed Javed Siddiqui | Post the review on 16th April 2020, included non-netted agreements in scope |
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| 1.3 | 15th Oct 2020 | Neeraj Sonber | Re-written FSD as per the new approach (On Prim Cloud Ready Solution).  Added Section 3.1 Data Requirement |
| 1.4 | 14th Dec 2020 | Neeraj Sonber | Updated Data gaps in appendix |
| 1.5 | 12th Feb 2021 | Neeraj Sonber | Added calculation requirement for all calculators.  Added known differences between EUAs and proposed solution |
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| 1.5.2 | 1st Mar 2021 | Neeraj Sonber | Incorporated review comments from Methodology for Bond Liquidity Assessment Calculator |

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# Introduction

[The introduction of the **Software Requirements Specification (SRS)** provides an overview of the entire document. It includes the purpose, scope, definitions, acronyms, abbreviations, references, and overview of the **SRS**.]

## Purpose of Document

This document elaborates the approach being taken for the construction of Margin Period of Risk(MPR) calculator. The logic and approach mentioned in this document would be considered for the construction of an elaborate IT solution.

## Definitions, Acronyms and Abbreviations

|  |  |
| --- | --- |
| MPR | Margin Period of Risk |
| SSC | ­Security shock calculator. (Bond market data required for the ratings-based liquidity calculation) |
| COP | Close Out Period |
| LAS | Liquidity Adjusted Stress |
| HtR | Hard to Replace Derivative |
| DELTA | Investment Bank's portfolio analysis and risk management system. (Multi-asset portfolio management and portfolio analysis online tool. It contains data for cash, bond, interest rate, credit derivatives, equities and commodities markets.) |
| CDS | Credit Default Swap (for Curve Broker List) |
| EQ | Equities |
| FX | Foreign Exchange |
| PM | Precious Metal |
| CR IN | Credit Index |
| CR Corp | Credit Corporate |
| CR Sov | Credit Sovereign |
| ABS | Asset backed securities |
| MBS | Mortgage backed securities |

## MPR Definition

In simple terms Margin Period of Risk (“MPR” or “MPOR”) refers to the effective time between a counterparty ceasing to post collateral and when the underlying transactions have been closed-out or replaced.

Definition of MPR in the Basel III documents (Annex4, para 103, bullets 2 & 3):

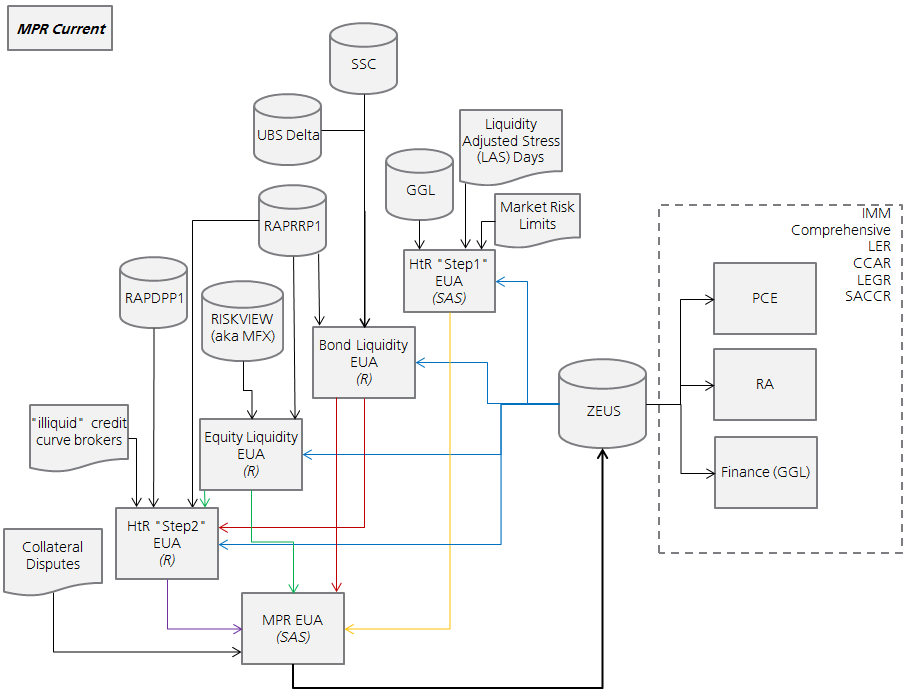
* For all netting sets where the number of trades exceeds 5000 at any point during a quarter, a supervisory floor of 20 business days is imposed for the margin period of risk for the following quarter.
* For netting sets containing one or more trades involving *either illiquid collateral*, or an *OTC derivative that cannot be easily replaced*, a supervisory floor of 20 business days is imposed for the margin period of risk. For these purposes, “Illiquid collateral” and “OTC derivatives that cannot be easily replaced” must be determined in the context of stressed market conditions and will be characterized by the absence of continuously active markets where a counterparty would, within two or fewer days, obtain multiple price quotations that would not move the market or represent a price reflecting a market discount (in the case of collateral) or premium (in the case of an OTC derivative). Examples of situations where trades are deemed illiquid for this purpose include, but are not limited to, trades that are not marked daily and trades that are subject to specific accounting treatment for valuation purposes (e.g. OTC derivatives or repo style transactions referencing securities whose fair value is determined by models with inputs that are not observed in the market).
* In addition, a bank must consider whether trades or securities it holds as collateral are concentrated in a counterparty and if that counterparty exited the market precipitously whether the bank would be able to replace its trades.
* If a bank has experienced more than two margin call disputes on a particular netting set over the previous two quarters that have lasted longer than the applicable margin period of risk (before consideration of this provision), then the bank must reflect this history appropriately by using a margin period of risk that is at least double the supervisory floor for that netting set for the subsequent two quarters.

# Current State

MPR is currently deployed as a series of End User Applications (EUAs) as below:

1. Bond EUA-written in R
2. Equity EUA-Written in R
3. HtR Step2 EUA-written in R
4. HtR Step1 EUA-written in SAS
5. MPR EUA-written in SAS

These EUA’s have done extremely well over the years. However, as MPR gains visibility with multiple internal and external stakeholders it is time to move toward a more stable and transparent infrastructure. There are also operational issues with two of the EUAs-SAS EUA’s which, if left unaddressed, could lead to the month end process failing.



## Bond EUA

Bond EUA performs illiquidity assessment of Trade and Collateral Data (for OTC, SFT and ETD netting agreements).

Data Sources:

| **Data Consumed** | **Data Type** | **Source System** | **Data Sourcing Mechanism** |
| --- | --- | --- | --- |
| Trade Data for OTC, SFT & ETD portfolio having bond underlying instrument | Transaction Data | ZEUS | DB Query |
| Collateral Data for OTC, SFT & ETD portfolio with instrument type as Bond | Transaction Data | RRS | DB Query |
| Bond Ratings | Reference Data | SSC | File |
| Bond Ratings | Reference Data | ZEUS | DB Query |
| Bond Liquidity Score | Reference Data | UBS DELTA | File |
| Bond Market Data | Reference Data | ZEUS | DB Query |

Following parameters are considered for Bond illiquidity assessment.

* Instrument type of Bond Instruments (ABS/MBS)
* Age of bond’s price
* Quantity of bond instruments
* Total Issued Quantity of Bond
* Ratings of the Bond (IG/Non-IG)
* Residual Maturity of the Bond
* Liquidity Score of Bond from DELTA

Broadly following rules are applied.

* All agreements which have ABS/MBS as underlying instrument or collateral instrument are classified as Illiquid.
* All agreements which have bond instruments for which age of price quotes is more than 5 days are classified as illiquid.
* All agreements which have bond instruments with large ownership percentage of the client position (i.e. ownership percentage is more than 5%) and have investment grade rating are classified as Medium Liquid.
* All agreements which have bond instruments with large ownership percentage of the client position (i.e. ownership percentage is more than 5%) and have non-investment grade rating are classified as Low Liquid.

Ownership percentage for each bond instrument is calculated as

**Ownership Percentage (per ISIN) [Qty%] = Total Amount held in our books per Cpty/ Total Outstanding Amount available in the Market (All ISIN for the issuer)**

* All agreements which have bond instruments with marginal ownership percentage of the client position (i.e. ownership percentage is less than 1.5%) and bonds rating is investment grade are classified as High Liquid.
* All agreements which have bond instruments with marginal ownership percentage of the client position (i.e. ownership percentage is less than 1.5%) and bonds rating is non-investment grade are classified as Medium illiquid.
* All agreements which have bond instruments with medium ownership percentage of the client position (i.e. ownership percentage is between 1.5% and 5%) and bonds rating is investment grade and total issue size is less than 1 billion CHF and Time to Maturity is less than 1 year are classified as Medium illiquid.
* All agreements which have bond instruments with medium ownership percentage of the client position (i.e. ownership percentage is between 1.5% and 5%) and bonds rating is investment grade and total issue size is greater than or equal to 1 billion CHF or Time to Maturity is greater than or equal to 1 year are classified as High Liquid.
* All agreements which have bond instruments with medium ownership percentage of the client position (i.e. ownership percentage is between 1.5% and 5%) and bonds rating is non-investment grade and total issue size is greater than 400 million CHF and Time to Maturity is more than 1 year are classified as Medium Liquid.
* All agreements which have bond instruments with medium ownership percentage of the client position (i.e. ownership percentage is between 1.5% and 5%) and bonds rating is non-investment grade and total issue size is less than 400 million CHF and Time to Maturity is less than 1 year are classified as Low Liquid.
* All agreement which are found as Liquid as per above steps (WM Liquidity Assessment) but have liquidity score from DELTA as less than or equal to 6 are classified as illiquid.
* If an agreement is classified as Illiquid but the counterparty is C17164, then override the liquidity status to Liquid.

This EUA provides output of illiquidity assessment at RXM, Agreement and portfolio level.

*Data Gap Handling*:- For missing value of mandatory attribute following fallback values are being used.

* If maturity date is NULL, default Residual Maturity as 0.1
* If ‘Total Outstanding Amount available in the Market (All ISIN for the issuer)’ is null default it to 1 CHF.
* If Bond’s rating is missing, default it to a Non-Investment grade instrument.
* If ownership percent is calculated as NULL default it to 6%
* If value date of price feed for a bond is NULL, default the age of price feed to 10 days

*List of reason codes (used in Report):*

|  |  |
| --- | --- |
| **Reason Code** | **Reason Desc** |
| 0 | Missing underlying ISIN |
| 1 | Missing market data in Zeus |
| 2 | PriceFeed(too old) > 5d |
| 3a | PriceFeed(ok) and MarginalPositionSize < 1.5 Prct and GoodRating (IG) |
| 3b | PriceFeed(ok) and MarginalPositionSize < 1.5 Prct but WeakRating (NonIG) |
| 5a | PriceFeed(ok) but LargePositionSize > 5 Prct and GoodRating (IG) |
| 5b | PriceFeed(ok) but LargePositionSize > 5 Prct but WeakRating (NonIG) |
| 6a | PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) and GoodRating (IG) and LargeIssueAmt (> 1bn) and LongTtM (> 1 yr) |
| 6b | PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) and GoodRating (IG) but [ SmallerIsseAmt (< 1bn) or ShorterTtM (< 1 yr) ] |
| 7a | PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) but WeakRating (NonIG) and LargerIssueAmt (> 400mn) and LongTtM (> 1 yr) |
| 7b | PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) but WeakRating (NonIG) but [ SmallerIssueAmt (< 400mn) or ShortTtM (< 1 yr) ] |





## Equity EUA

Equity EUA performs illiquidity assessment of Trade and Collateral Data (for OTC, SFT and ETD netting agreements).

Data Sources:

| **Data Consumed** | **Data Type** | **Source System** | **Data Sourcing Mechanism** |
| --- | --- | --- | --- |
| Trade Data for OTC & SFT portfolio having equity underlying instrument | Transaction Data | ZEUS | DB Query |
| Collateral Data for OTC & ETD portfolio with instrument type as Equity | Transaction Data | RRS | DB Query |
| Equity Market Data | Reference Data | RiskView | DB Query |

Following parameters are considered for Equity illiquidity assessment.

* Quantity of equity instruments
* Average Traded quantity of equity instrument for last 30 days

All agreements are marked as Illiquid which have equity instruments having unloading period more than 5 days. Unloading period of an equity instrument is calculated as

**Quantity of equity instruments per counterparty / (0.2 \* Average Traded quantity of equity instrument for last 30 days)**

This EUA provides output of illiquidity assessment at RXM, Agreement and portfolio level.



## HtR Step1 EUA

HtR Step1 EUA identifies counterparties which have OTC Trades which would be difficult to replace under stress period. This EUA provides output of HtR assessment at RXM, Risk Factor and portfolio level.

Data Sources:

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Consumed** | **Data Type** | **Source System** | **Data Sourcing Mechanism** |
| Transaction Sensitivity for Risk Categories (EQ, PM, FX, IR, CR) | Transaction Data | ZEUS MIS | DB Query |
| Transaction Sensitivity for Options | Transaction Data | ZEUS MIS | DB Query |
| LAS Holding Period | Reference Data | SharePoint | File (SharePoint) |
| Delta Limits for Risk Factors | Reference Data | ARISK | File |
| Options Maturity Limit | Reference Data | ARISK | File |

Following are the main parameters considered for HtR assessment at counterparty level.

* Transaction Deltas for each risk factor
* IB Delta Limits for each risk factor
* LAS Holding Period for each risk factor

For HtR assessment Pseudo holding period for each counterparty and risk factor is computed as follows

Where

If above calculated pseudo holding period is more than 10 then counterparty is identified as HtR for the risk factor and portfolio.

For Credit (Index) Risk Category Delta Limit and LAS holding period is at Index i.e. Delta limit and LAS holding period is different for different reference Index.

Since Risk Infrastructure has only Delta as the sensitivity measure, other sensitivity measures (e.g. Vega) is not available, for OTC Options transactions additional assessment of HtR is done using the maturity limit. All Counterparties which have Options transactions with remaining trade maturity, more than maturity Limit will be classified as HtR.

This EUA provides output of HtR assessment at RXM, Risk Factor and portfolio level.



## HtR Step2 EUA

HtR Step2 EUA identifies OTCS Trades which would be difficult to replace because of their trade characteristics.

***Data Sources:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Consumed** | **Data Type** | **Source System** | **Data Sourcing Mechanism** |
| OTCS Trades | Transaction Data | ZEUS | DB Query |
| Trades | Transaction Data | RRS | File |
| TV Diff Mapping (Product Classification Vanilla/Exotic) | Reference Data | RA | File |
| Market Data (for Equity and Debt Instruments) | Reference Data | ZEUS | DB Query |
| CDS Curve Broker Data | Reference Data | MarkIT | File |
| Illiquid Bond Report | Transaction Data | Bond EUA | File |
| Illiquid Equity Report | Transaction Data | Equity EUA | File |

Following are the main parameters considered for HtR Step2 assessment at counterparty level.

* Trade Type, Trade Sub Type and System Trade Type
* Underlying Risk Drivers for the trade
* illiquid Bond Instrument
* illiquid Equity Instrument

Broad steps of processing are as follows

* Classify each trade into following Exotic & Vanilla product category using Trade Type, Trade Sub Type and System Trade Type and mapping from TV DIff
  + Exotic Credit
  + Exotic Equities
  + Exotic FX
  + Exotic Rates
  + Vanilla Commodities
  + Vanilla Credit
  + Vanilla Equities
  + Vanilla FX
  + Vanilla Rates
  + Unclassified
* Classify all trades having Exotic product Category as HtR.
* If Product Category = Vanilla FX and underlying risk driver have a currency combination from non-industrialized currencies (i.e. not among USD, CHF, GBP, EUR, JPY, AUD, CAD, DKK, NZD, NOK, SEK), trade is classified as HtR
* If Product Category != ‘Vanilla FX’ and underlying risk driver have a currency combination from no Big Six currencies (i.e. not among USD, CHF, GBP, EUR, JPY, AUD), trade is classified as HtR.
* If trades have illiquid underlying equity instrument or illiquid bond instrument trade is classified as HtR.
* If trades have a underlying risk driver as ‘Credit:’ and its corresponding curve is illiquid (i.e. less than 3 broker quotes) trade is classified as HtR.
* If trade is unclassified, it’s classified as HtR





## MPR EUA

MPR EUA performs the final assessment of OTC, ETD and SFT Trades for extended MPR by combining output of all EUAs.

Data Sources:

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Consumed** | **Data Type** | **Source System** | **Data Sourcing Mechanism** |
| OTC, SFT & ETD\_CLEARED Trades count | Transaction Data | ZEUS | DB Query |
| OTC\_CLEARED Trades count | Transaction Data | ZEUS | DB Query |
| ETD Trades count | Transaction Data | ZEUS (Merival Data) | DB Query |
| Equity Illiquid Report | Transaction Data | Equity EUA | File |
| Bond Illiquidity Report | Transaction Data | Bond EUA | File |
| LED Margin Frequency | Reference Data |  | File |
| ZEUS Margin Frequency | Reference Data | ZEUS | DB Query |
| Margin Dispute – ETD | Transaction Data |  | File (<-- email) |
| Margin Dispute – OTC | Transaction Data |  | File (<-- email) |
| Margin Dispute – SFT | Transaction Data |  | File (<-- email) |
| HtR Under Stress | Transaction Data | HtR Step 1 EUA |  |
| HtR Step 2 | Transaction Data | HtR Step 2 EUA |  |
| HtR L3 Trades | Transaction Data | ZEUS (Merival Data) | DB Query |
| Illiquid Collateral L3 for SFT | Transaction Data | ZEUS (Merival Data) | DB Query |
| Non Qualifying CCP | Transaction Data | ZEUS (Merival Data) | DB Query |
| Broker Client Leg | Transaction Data | ZEUS (Merival Data) | DB Query |

Following are the main parameters considered for Final MPR assessment at counterparty level.

* Max Trade count of each agreement for past 90 days
* Margin Frequency of agreements
* Illiquid collateral (Bond, Equity and L3) info of agreements
* HtR (Under Stress, HtR Trade, L3 trade) under agreements
* Margin Disputes for all portfolios

Broad rules of processing are

* First Standard supervisory floors are applied to each agreement based on below table

|  |  |  |
| --- | --- | --- |
| # | Portfolio | Standard Supervisory floor for MPR |
| 1 | OTC | 15 Calendar Days |
| 2 | OTC\_CLEARED | 7 Calendar Days |
| 3 | ETD (facing NCCP or broker) | 15 Calendar Days |
| 4 | ETD\_CLEARED (facing NCCP or broker) | 15 Calendar Days |
| 5 | ETD (not facing NCCP or broker) | 7 Calendar Days |
| 6 | ETD\_CLEARED (not facing NCCP or broker) | 7 Calendar Days |
| 7 | SFT (ISDA PB agreement) | 15 Calendar Days |
| 8 | SFT | 7 Calendar Days |

* If any agreement meet any of following conditions, its MPR is revised to extended MPR
  + Transaction count > 5000
  + Has illiquid equity collateral
  + Has illiquid bond collateral
  + Has L3 collateral
  + Is HtR under stress
  + Has HtR Trade
  + Has HtR L3 Trades
* If counterparty has more than 2 margin disputes for which age of dispute is more than the MPR, then Final MPR is calculated as

MPR = MPR × 2 × (Margin Freq – 1)

* Else Final MPR is calculated as

MPR = MPR × (Margin Freq – 1)





# Functional Requirement

## Data Requirement

This section describes the various data feed and data attributes that are needed in calculators of MPR. Note that the design proposed here is to take the lowest level of data available (position/trade level/Agreement level) as this will act as the basis for the Liquidity, HtR and MPR calculations. This level will also provide full transparency into the aggregated reporting figures and will also make the application capable to build drill-down reports. All feeds will be required on a daily basis.

### Trades/Positions

This feed is a list of all open trades/positions for OTC, OTC\_CLEARED, ETD\_CLEARED, SFT portfolios and contain the data items listed below. This data is used by all MPR calculators.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Trade Code | A unique Identifier for the trade/position. | Text | M | 0.71.201975858 |
| Portfolio Code | Defines Portfolio code of the trade e.g. OTC, SFT, ETD | Text | M | SFT |
| Agreement Code | Agreement code of the Trade | Text | M | 9.1E+08 |
| Credit Relationship Code | Credit Relationship code of the counterparty involved in Trade | Text | M | B40219 |
| Maturity Date | Maturity Date of the trade | Date | M | 9/30/2020 |
| Product Code | Product code of the trade | Text | M | BORV |
| Instrument Driven product code | Product code base on underlying instrument | Text | M | EQLN |
| Reference Entity Party Code | Party Code of the reference entity (in case trade is Credit trade) | Text | M | C90124 |
| Reference Entity CCONSOL | CONSOL id of the Reference entity (in case trade is credit trade) | Text | M | 6128565 |
| Relationship Type | Indicates the type of cleared trade - Client (CL), broker (BR) or exchange (EX) List of values: CLOTC,BROTC,EXOTC CLETD,BRETD,EXETD | Text | M | CLETD |
| UBS Branch Code | UBS entity settlement branch code of the trade | Text | O | 350 |
| Underlying Quantity | Quantity of underlying instrument | Text | M | 4000 |
| Notional | Notional Amount of underlying instrument | Decimal | M | 40000 |
| Notional Currency Code | Notional Currency Code | Text | M | USD |
| Underlying Instrument Code | Underlying Instrument of the trade (ISIN) | Text | M | US10713107 |
| Trade Type | Type of Trade | Text | M | Exotic,  Knockout |
| Trade Sub Type | Sub Type of Trade | Text | M | CREDIT\_OPTION |
| System Trade Type | System Trade Type | Text | M | MMF CMS Swap |
| Underlying Risk Driver | Underlying Risk Driver of the Trade | Text | M | FX:GBPUSD;InterestRate:GBP;InterestRate:USD |

### Trade Risk Measurement

This feed is Trade level exposure measures. This data is used in Bond and Equity Liquidity assessment calculators. These calculators use the trades for which expected Mark to Market Values are available for COP methodology under Default scenario.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Trade Code | A unique Identifier for the trade/position. | Text | M | 0.71.201975858 |
| Methodology Code | Methodology Code of trade exposure measure | Text | M | COP |
| Scenario Name | Scenario Name of exposure measure | Text | M | DEFAULT |
| Time Point | Time Point | Text | M | D000 |
| Emtm Value | Expected Mark to Market Value | Decimal | M | 3243544.83 |

### Credit Default Swap

This feed is used by HtR Step2 calculator to identify if underlying reference instrument is an illiquid instrument.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Trade Code | Trade Code | Text | M | 28947893L0 |
| Reference Instrument code | Reference Instrument code of Credit Default Swap | Text | M | US87612BAR33 |

### Collateral

This feed is for Collateral positions of OTC/SFT/ETD Agreements. This data is used by Bond and Equity Liquidity assessment calculators to identify the concentration of instrument against a single counterparty.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Collateral Trade Code | Unique Trade code of Collateral position | Text | M | 910337700 |
| Portfolio Code | Portfolio Code to which collateral belongs | Text | M | OTC |
| Product Code | Product Code of the trade | Text | M | BORV |
| Instrument Driven Product Code | Instrument Driven Product Code | Text | M | EQLN |
| Legal Agreement Code | Legal Agreement Code | Text | M | 910337700 |
| Credit Relationship Code | Credit Relationship code of the counterparty involved in Trade | Text | M | B40219 |
| Instrument Type | Type of Instrument (i.e. Bond, Equity) | Text | M | Bond |
| Instrument Code | Instrument identifier code (ISIN) | Text | M | US00913CAA71 |
| Notional Amount | Notional Amount of collateral Instrument | Text | M | 154344.5223 |
| Currency | Currency for Notional amount | Text | M | USD |
| Quantity | No of units of instrument placed as collateral | Text | M | 86000 |

### Trade Sensitivities

This feed is for Trade Sensitivities of OTC portfolio. This data is used in HtR Step 2 calculator.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Trade Code | Trade Code | Test | M | 28947893L0 |
| Credit Relationship Code | Credit Relationship code of the counterparty involved in Trade | Text | M | B40219 |
| Portfolio code | Portfolio code | Text | M | OTC |
| Risk Category | Risk category | Text | M | EQ |
| Risk Factor | Risk Factor | Text | M | USD |
| Reference Entity Index Flag | Flag to indicate if reference entity is an index | Text | M | Y |
| Reference Entity Govt Flag | Flag to indicate if reference entity is Govt entity | Text | M | N |
| Delta USD | Delta Amount in USD | Text | M | 8743837.5 |
| Risk Delta USD | Risk Delta Amount in USD | Text | M | 283209.73 |

### Level 3 Transactions

Level 3 transactions are those transactions accounted for at fair value using a valuation technique with significant unobservable market data. These are identified using VALUATION\_METHOD code. Trades and Collateral with VALUATION\_METHOD code of OT, OU and ON are identified as Level 3 Transactions.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Trade Code | Trade Code | Text | M | 28947893L0 |
| Agreement Code | Agreement code | Text | M | 910087375 |
| Credit Relationship Code | Counterparty code | Text | M | CL6705 |
| Trade Source System Code | System code of the Source system of the trade | Text | M | GROT |
| SAP Functional Area code | SAP Functional Area code | Text | M | GV17 |
| WMSB indicator | WMSB indicator | Text | M |  |
| Parent rating | Parent rating | Text | M | A1 |
| Valuation method | Valuation method | Text | M | OT |
| GCR Reg Product type | GCR Reg Product type | Text | M | 3501 |
| GCR Group Account id | GCR Group Account id | Text | M | 28300 |
| Portfolio Code | Portfolio Code | Text | M | SFT |

### Agreement

Feed for Agreement Static data is needed for MPR Calculator.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Legal Agreement Code | Legal Agreement Code | Text | M | 5024497 |
| Legal Agreement Type Code | Agreement type. Indicates type of legal documentation applicable for Agreement | Text | M | ISDA |
| Legal Agreement Version | Version of the legal agreements | Text | M | 1992 Agreement |
| Agreement Name | Name of the agreement | Text | M | ISDA 1992 Agreement |
| Netting Collateral Indicator | Indicates type of netting allowed for collateral | Text | M | M |
| Agreement Date | Date of Agreement | Text | M | 2014-11-12 |
| Agreement UBS Entity | UBS entity who has entered into agreement with counterparty | Text | M | UBS AG |
| Margin Call Frequency | Minimum time period after which call for additional collateral can be raised. | Text | M | Daily |

### Agreement Trade Count

This feed provides the maximum trade count against each agreement for last one quarter. This data is used in Extended MPR computation. Trade Count should be based on positions within agreement.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Netting Legal Agreement Code | Legal Agreement Code for Netting of exposure | Text | M | 91033700 |
| Netting Agreement Type Code | Netting Agreement Type Code | Text | M | ISDA |
| Collateral Legal Agreement Code | Legal Agreement Code for Netting of Collateral | Text | M | 910337123 |
| Collateral Agreement Type Code | Collateral Agreement Type Code | Text | M | ISDA CSA |
| Portfolio Code | Portfolio code | Text | M | OTC |
| Trade Count | Max count of trades for the agreement for last 90 days. | Text | M | 520 |

### Liquidity Adjusted Stress Days

This feed provides Liquidity Adjusted Stress days (i.e. Holding Period) for Risk Categories and Risk Factors. This data is used in HtR Step 1 calculator.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| Risk Category | Risk Category | Text | M | FX |
| Risk Factor | Risk Factor | Text | M | USD |
| LAS Days | Liquidity Adjusted Stress Days | Text | M | 10 |

### Delta Limits

This feed is for IB Delta Limits and used in HtR Step 1 calculator.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| Risk Category | Risk Category | Text | M | FX |
| Risk Factor | Risk Factor | Text | M | USD |
| Limit USD | Delta Limits in USD | Text | M | 24000 |

### Options Maturity Limit

This feed is for OTC Options Maturity Limits and used in HtR Step 1 calculator.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Risk Category | Risk Category | Text | M | FX |
| Maturity Limit | Maturity Limit in Days | Text | M | 120 |

### TV Diff Mapping

This feed provides the mapping between Product Classification to Product Category (Exotic/Vanilla) of OTC Trades. This data is used in HtR Step 2 calculator.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Product Classification | Product Classification as derived from Trade Type, Trade Sub Type and System Trade Type | Text | M | CMTOPTION#INF\_CAP\_ZC#MMF CMT FX Option |
| Product Category | Product Category | Text | M | Exotic |

### Credit Curve quotes count

This feed provides the count of broker quotes for a particular Redcode or reference entity (not the quotes themselves). Currently EUA is sourcing this data from front office (MarkIT).

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Credit Curve Name | Credit Curve Name | Text | M | AIB\_SEN\_DISCOUNT |
| RED ID | Reference Entity ID from Markit | Text | O | 01AB4A |
| Entity Name | Name of the reference Entity | Text | O | Allied Irish Banks Public Limited Company |
| Restructuring code | Restructuring code | Text | O | MMR |
| Currency | Currency | Text | O | GBP |
| Seniority Code | Seniority Code | Text | O | SUB |
| Brokers Count | Count of Brokers who provided quotes for Reference Entity | Integer | M | 1 |

### Margin Disputed Agreements

This feed contains the margin dispute details of agreements. A margin call dispute occurs when a margin call is not fully agreed to as evidenced by the margin response. It is a margin call dispute when UBS is the party calling for additional collateral. This data is used by MPR calculator to compute extended MPR.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Dispute ID | Unique identifier for Dispute | Text | M | 10721415 |
| Client Relationship Code | Client Relationship Cod | Text | M | C70359 |
| Agreement Code | Agreement Code also known as DOX ID | Text | M | 910093607 |
| Master Agreement code | Master Agreement Code also known as DOX MASTER ID | Text | M | 5118717 |
| XCOLL System ID | XCOLL System ID | Text | M | 220546754 |
| Portfolio Code | Portfolio Code | Text | M | OTC |
| Legal Entity | Legal Entity | Text | M | UBS AG |
| Call Driver Type | Margin Call Driver Type | Text | M | VM |
| Client Relationship Name |  | Text | O | UBS DIVERSIFIED FIXED INCOME FUND UBSGAMAL AS RE UDFI0000 |
| Dispute Start Date | Dispute Start Date | Date | M | 2020-02-20 |
| Latest Age of Dispute | Latest Age of Dispute | Integer | M | 631 |

### Instrument Static

Static attribute of all active/held securities.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Instrument ID | Instrument id | Text | M | 10721415 |
| ISIN | ISIN no of the Security | Text | M | US2963151046 |
| CUSIP | CUSIP of Security | Text | M | 296315104 |
| VOLOREN | VOLOREN of Security | Text | M | 1104623 |
| FOS | FOS of Security | Text | M | 10721415 |
| BB Ticker | Bloomberg Ticker | Text | M | CMB |
| Issue Name | Name of Security | Text | M | ESCO TECHNOLOGIES ORD |
| Maturity Date | Maturity Date of Security | Date | M | 2022-12-15 |
| Status | Status of the Seucrity | Text | M | ACTIVE |
| ISO Classification Type | ISO Classification Type of the security | Text | M | ESV-FR-- |
| Instrument Type | Instrument Type of the security | Text | M | ES |
| Bloomberg Classification Type | Bloomberg Classification Type | Text | M | RABS |
| Party Code | Party code of the issuer (i.e. Cconsol) | Text | M | 16445 |
| Bond Outstanding Amount | Issue size of the debt instrument. i.e. Total Debt amount raised by the issuer from this instrument | Decimal | M | 1770239507 |
| Nominal Value | Nominal Value or Face Value | Decimal | M | 0.0001 |
| Nominal Currency Code | Nominal Currency Code | Text | M | USD |
| Country Code of the issuance | Country Code of the issuance | Text | O | US |

### Instrument Price

This feed contains prices for all the instruments. Instrument Price details is used to in Equity Liquidity assessment.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Source Instrument ID | Source Instrument id | Text | M | 10721415 |
| Value Date | Value Date for Price of Instrument | Text | M | 2020-06-30 |
| Currency Code | Currency code for Price of the Instrument | Text | M | CHF |
| Dirty Mid Price | Price of the Debt Instrument | Decimal | M | 345.56 |
| Mark Price | Mark Price of the security/Instrument | Decimal | M | 546.09 |
| ADTV 30 Days in USD | Average Daily Traded Volume for Last 30 Days in USD | Decimal | M | 235546.45 |

### Instrument Rating

This feed contains external ratings for all the instruments. Instrument Ratings data is used in Bond Liquidity Assessment.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Source Instrument ID | Source Instrument id | Text | M | 10721415 |
| Rating Type | Rating Type | Text | M | S&PLTMAT |
| Rating Value | External Rating Value | Text | M | BBB+ |

### Instrument Liquidity Score (UBS Delta)

This feed contains liquidity scores of Debt instruments (from an external system UBS Delta). This data is used in Bond Liquidity Assessment.

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| ISIN | ISIN no of Debt Instrument | Text | M | US0721415 |
| Liquidity Score | Liquidity Score | Text | M | 6 |

### Client Relationship Details

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Client Relationship code | RXM code or Client Relationship code | Text | M | B01237 |
| Party Code | Party Code of the Counterparty | Text | M | 10721415 |

### Party Details

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Party code | Source system party identifier i.e. CCONSOL/GPID | Text | M | 10721415 |
| Name | Name of the counterparty | Text | M | Allied Airish XXX Ltd |
| Portfolio Segment | Portfolio Segment of the counterparty | Text | M | CLQ |

### Exchange Rates

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| From Currency Code | From Currency Code | Text | M | USD |
| To Currency Code | To Currency Code | Text | M | CHF |
| Time Point | Time point of the exchange rate | Text | M | D000 |
| Conversion Rate | Conversion Rate | Text | M | 1.0021 |

### Index Issuer Mapping

| **Field Name** | **Description** | **Data Type** | **Mandatory/Optional** | **Example Data from existing MPR feed** |
| --- | --- | --- | --- | --- |
| Index Issuer | Issuer of the Credit Index i.e. Reference Entity Name of the Index CDS | Text | M | CDX NA IG SERIES 6 |
| Index | Index Name | Text | M | CDX\_IG |

## Calculation Requirement

### Equity Liquidity Assessment Calculator

This calculator will perform the liquidity assessment of all agreements which have Trade or Collateral’s underlying instrument as Equity.

Input Datasets:

1. Trades/Positions
2. Trade Risk Measurement
3. Collateral
4. Instrument Static
5. Instrument Price
6. Exchange Rate

Data Selection:

* Select all trades having equity oriented underlying instrument (in the same way as the legacy calculator is selecting) using following filters
  + *‘Product Code’* in EQPO\_SL, EQPO\_PB, EQRP\_SL, EQPO, CNVE\_PB
  + Trade Risk Measures exists with *‘Scenario’* as Default and *‘Methodology’* COP.
* Select all collaterals having equity oriented underlying instrument (in the same way as the legacy calculator is selecting) using following filters:
  + *‘Product Code*’ in EQPO\_ETD, EQPO

Computation Rules:

Following additional measures are to be computed before applying rules of illiquidity for underlying equity instruments.

| **Measure Name** | **Input Dataset** | **Input Attributes** | **Derivation Logic** |
| --- | --- | --- | --- |
| Underlying Position in USD | Trade | Notional | For each Trade & Collateral of OTC, SFT & ETD\_CLEARED Portfolio where ‘*Notional*’ is present (i.e. ‘*Notional*’ != 0)  Conversion Rate = Exchange Rate to convert ‘*Notional*’ amount from Notional Currency to USD  For each Trade & Collateral of OTC, SFT & ETD\_CLEARED Portfolio where ‘*Notional*’ is 0 but underlying Quantity is present (i.e. ‘*Underlying Quantity*’ > 0)  Where Price of Security = ‘*Mark Price’* or ‘*Dirty Mid Price*’ whichever is present  Conversion Rate = Exchange Rate to convert Price of Security from CHF to USD  P.S.: For some instruments (e.g. preferred stock) Dirty Mid Price will be present instead of Mark price |
| Collateral | Notional |
| Trade | Underlying Quantity |
| Collateral | Underlying Quantity |
| Trade | Notional Currency Code |
| Collateral | Notional Currency Code |
| Instrument Price | Mark Price |
| Instrument Price | Dirty Mid Price |
| Exchange Rate | Conversion Rate |
| Underlying Position Approach | Trade | Notional | If ‘*Notional*’ = 0 & ‘*Underlying Quantity*’ >0 then “Underlying Quantity Based”  Else “Notional Based” |
| Trade | Underlying Quantity |
| Collateral | Notional |
| Collateral | Underlying Quantity |
| Total Client Position (in USD) | Trade | Underlying Position in USD | For each Credit Relationship Code & Instrument of OTC, SFT & ETD Portfolio |
| Collateral | Underlying Position in USD |
| Exchange Rate | Conversion Rate |
| Liquidity Adjusted COP |  | Total Client Position | For each Credit Relationship-Instrument pair |
| ADTV 30 Days in USD |

*Data Gap Handling*:- For missing value of attributes following fallback values would be used and Fallback reason would be populated.

* If Mark Price and Dirty Mid Price is blank/null or not available for any instrument default the value to 1 USD and ‘*Fallback Reason*’ will be populated as “No Equity Price Data”.
* If ‘*ADTV 30 Days in USD’* is blank/null or not available for an instrument then default the value to 0.00001 and ‘*Fallback Reason*’ will be populated as “No Equity volume data”.

If we have multiple data gaps, all data gaps fallback reason should be concatenated using “|” as delimiter.

Following rules are to be applied sequentially on each Credit Relationship-Instrument pair to arrive at ‘*Liquidity Status*’ of the pair.

* If ‘*Liquidity Adjusted COP*’ of the client-instrument pair is less than or equal to 5 then ‘*Liquidity Status*’ is classified as Green.
* If ‘*Liquidity Adjusted COP*’ of the client-instrument pair is more than 5 and less than or equal to 50 then ‘*Liquidity Status*’ is classified as Amber with ‘*Liquidity Reason*’ as “Large EQ holding vs. 30D avg”.
* If ‘*Liquidity Adjusted COP*’ of the Credit Relationship-Instrument pair is more than 50 then ‘*Liquidity Status*’ is classified as Red with ‘*Liquidity Reason*’ as “Large EQ holding vs. 30D avg”.
* If ‘*Liquidity Status*’ of the Credit Relationship-Instrument pair is Red or Amber then ‘*Final Liquidity Status*’ is classified as illiquid. For all other cases its classified as Liquid.
* Transfer the ‘*Final* *Liquidity Status*’ and all other measures from Credit Relationship-Instrument pair to Agreement level.

Workflow:



Outputs:

Following two files would be generated as output of Equity Liquidity Assessment Calculator.

1. Equity Liquidity Analytics File: This file contains all the instruments for all agreements along with its ‘*Liquidity Status’* and ‘*Liquidity Reason*’.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Agreement Code | Agreement Code |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| Product Code | Product Code of the Trade |
| ISIN | ISIN of underlying instrument |
| CUSIP | CUSIP of the Instrument |
| BB Ticker | BloomBerg Ticker of the Instrument |
| Issue Name | Name of the security/instrument |
| Underlying Position Approach | Approach taken to compute Underlying Position of Trade i.e. Underlying |
| Underlying Position in USD | Underlying Position in USD |
| Total Underlying Amount | Total Underlying Amount in USD (i.e. Total Client Position in USD) |
| Average Daily Traded Volume | Average Daily Traded Volume of the instrument (in USD) |
| Liquidity Adjusted COP | Liquidity Adjusted Close out period |
| Liquidity Status | Liquidity Status of the underlying Instrument |
| Liquidity Reason | Liquidity Reason Description |
| Fallback Reason | Reason for falling back to default value |
| Final Liquidity Status | Final Liquidity Status |

1. Illiquid Equity File: This file will contain only agreement having Illiquid Equity Instrument.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Agreement Code | Agreement Code |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| Liquidity Status | Liquidity Status of the underlying Instrument |
| Liquidity Reason | Liquidity Reason Description |
| Fallback Reason | Reason for falling back to default value |
| Final Liquidity Status | Final Liquidity Status |

### Bond Liquidity Assessment Calculator

This calculator will perform the liquidity assessment of all agreements which have Trade or Collateral’s underlying instrument as Bond.

Input Datasets:

1. Trades/Positions
2. Trade Risk Measurement
3. Collateral
4. Instrument Static
5. Instrument Rating
6. Instrument Price
7. Instrument Liquidity Score

Data Selection:

* Select all trades having Debt oriented underlying instrument using following filters
  + *‘Product Code’* in BOFO, BOOP, BOPO, BOBSB, BOLN, BOPLRP, BOPLRV, BOPO\_PB, BOPO\_REP, BOPO\_SL, BORP, BORV, BOSBB, BOTRRP, BOTRRV, CNVB\_PB, MOFO, MORP, MORV, SLRP, SLRV, BOLN\_SL
  + *‘Instrument type*’ of the underlying instrument is not in ES, EP, EU, EM, EC
  + Trade Risk Measures exists with *‘Scenario’* as Default and *‘Methodology’* COP.
* Select all collaterals having Debt oriented underlying instrument using following filters:
  + *‘Product Code*’ in BOFO, BOOP, BOPO, BOBSB, BOLN, BOPLRP, BOPLRV, BOPO\_PB, BOPO\_REP, BOPO\_SL, BORP, BORV, BOSBB, BOTRRP, BOTRRV, CNVB\_PB, MOFO, MORP, MORV, SLRP, SLRV, BOLN\_SL, BOPO\_ETD
  + *‘Instrument type*’ of the underlying instrument is not in ES, EP, EU, EM, EC

Computation Rules:

Following additional measures are to be computed before applying rules of illiquidity for underlying bond instruments.

| **Measure Name** | **Input Dataset** | **Input Attributes** | **Derivation Logic** |
| --- | --- | --- | --- |
| ABS/MBS Instrument identifier | Instrument Static | ISO Classification Type | If fourth letter of ‘ISO Classification Type’ of the underlying instrument is ‘R’ then instrument is an MBS (Mortgage Backed Security).  If fourth letter of ‘ISO Classification Type’ of the underlying instrument is ‘A’ then instrument is an ABS (Asset Backed Security). |
| Time to Maturity | Instrument Static | Maturity Date | For each instrument  (Maturity Date - Current Business Date) |
| Total Bond Outstanding of Issuer (in CHF) | Instrument Static | Bond Outstanding Amount | For each Issuer (i.e. Party Code)  Where  Conversion rate = Exchange Rate to convert Debt Outstanding Amount from Nominal currency to CHF |
| Instrument Static | Nominal Currency Code |
| Instrument Static | Party Code |
| Exchange Rates | Conversion Rate |
| Age of Price Quote | Instrument Price | Value Date | For each instrument  (Current Business Date – Value Date) |
| Rating Grade | Instrument Rating | Rating Value | Please refer appendix 5.3 for mapping of different rating to Investment Grade and Non-Investment Grade ratings.  In case of multiple external rating for the same instrument, rating grade is considered based on worst rating of the instrument. |
| Ownership Percentage of Client Position | Instrument Static | Nominal Value | For each Credit Relationship Code & Instrument of OTC, SFT & ETD\_CLEARED Portfolio  Where  Conversion rate = Exchange Rate to convert Notional from Notional currency to CHF |
| Instrument Static | Nominal Currency Code |
| Trades/Position | Notional |
| Trades/Position | Credit Relationship Code |
| Exchange Rates | Conversion Rate |

*Data Gap Handling*:- For missing value of attributes following fallback values would be used and Fallback reason would be updated. Fallback reason to be updated as per following priority.

* If ISIN of underlying instrument is missing for any trade/collateral. ‘*Fallback Reason*’ to be updated as “Missing ‘Underlying *ISIN*’”
* If ‘*Total Debt Outstanding of Issuer*’ is null default it to 1 CHF. ‘*Fallback Reason*’ to be updated as “Missing ‘*Total Debt Outstanding of Issuer’*”
* If *‘Ownership Percentage of Client Position’* is calculated as NULL default it to 6%. ‘*Fallback Reason*’ to be updated as “Missing ‘*Ownership Percentage of Client Position’*”
* If Instrument’s ‘*Rating Value*’ is missing, default ‘*Rating Grade*’ to Non-IG. ‘*Fallback Reason*’ to be updated as “Missing ‘*Rating Value’*”
* If value date of price feed for a bond is NULL, default the age of price feed to 10 days. ‘*Fallback Reason*’ to be updated as “Missing ‘*Value Date of Price Feed*’”
* If ‘*Maturity Date*’ is NULL, default ‘*Time to Maturity’* as 0.1. ‘*Fallback Reason*’ to be updated as “Missing ‘*Maturity Date’*”

Following rules are to be applied sequentially on each Credit Relationship-Instrument pair to arrive at ‘*Liquidity Status*’ of the pair. Attributes are mentioned in Italics and within single quotes.

* If UBS Instrument ID of the underlying instrument is missing then ‘*Liquidity Status*’ is classified as Illiquid with ‘Liquidity Reason’ as “0 - Missing underlying UBS Instrument ID”
* If the underlying instrument is an ABS or MBS (i.e. ‘*ABS/MBS Instrument identifier*’ is either ABS or MBS) ‘*Liquidity Status*’ is classified as Illiquid with ‘*Liquidity Reason’* as “Underlying Instrument is ABS/MBS”
* If the *‘Age of Price Quote’* of the underlying bond instrument is more than 5 days then ‘*Liquidity Status*’ is classified as illiquid with ‘*Liquidity Reason’* as “2 - Price Feed (too old) > 5d”.
* If the client (i.e. Credit Relationship) has large ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is more than 5%) and ‘*Rating Grade’* of underlying bond Instrument is IG then ‘*Liquidity Status*’ is classified as Medium Liquid with ‘*Liquidity Reason’* as “5a - PriceFeed(ok) but LargePositionSize > 5 Prct and GoodRating (IG)”.
* If the client has large ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is more than 5%) and ‘*Rating Grade’* of the instrument is Non-IG then ‘*Liquidity Status*’ is classified as Low Liquid with ‘*Liquidity Reason’* as “5b - PriceFeed(ok) but LargePositionSize > 5 Prct but WeakRating (NonIG)”.
* If the client has marginal ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is less than 1.5%) and ‘*Rating Grade’* of the instrument is IG then ‘*Liquidity Status*’ is classified as High Liquid with ‘*Liquidity Reason’* as “3a - PriceFeed(ok) and MarginalPositionSize < 1.5 Prct and GoodRating (IG)”.
* If the client has marginal ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is less than 1.5%) and ‘*Rating Grade’* of the instrument is Non-IG then ‘*Liquidity Status*’ is classified as Medium Liquid with ‘*Liquidity Reason’* as “3b - PriceFeed(ok) and MarginalPositionSize < 1.5 Prct but WeakRating (NonIG)”.
* If the client has medium ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is between 1.5% and 5%) and underlying instrument’s ‘*Rating Grade’* is IG and ‘Bond *Outstanding Amount*’ of the instrument is less than 1 billion CHF and ‘*Time to Maturity*’ of the instrument is less than 1 year then ‘*Liquidity Status*’ is classified as Medium Liquid with ‘*Liquidity Reason’* as “6b - PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) and GoodRating (IG) but [ SmallerIsseAmt (< 1bn) or ShorterTtM (< 1 yr)”.
* If client has medium ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is between 1.5% and 5%) and underlying instrument’s ‘*Rating Grade’* is IG and ‘Bond *Outstanding Amount*’ is greater than or equal to 1 billion CHF or ‘*Time to Maturity*’ is greater than or equal to 1 year then ‘*Liquidity Status*’ is classified as High Liquid with ‘*Liquidity Reason’* as “6a - PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) and GoodRating (IG) and LargeIssueAmt (> 1bn) and LongTtM (> 1 yr)”.
* If client has medium ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is between 1.5% and 5%) and underlying instrument’s ‘*Rating Grade’* is Non-IG and ‘Bond *Outstanding Amount*’ is greater than 400 million CHF and ‘*Time to Maturity*’ is more than 1 year then ‘*Liquidity Status’* is classified as Medium Liquid with ‘*Liquidity Reason’* as “7a - PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) but WeakRating (NonIG) and LargerIssueAmt (> 400mn) and LongTtM (> 1 yr)”.
* If client has medium ‘*Ownership percentage of the client position’* (i.e. ‘*Ownership percentage of the client position’* is between 1.5% and 5%) and underlying instrument’s ‘*Rating Grade’* is Non-IG and ‘Bond *Outstanding Amount*’ is less than 400 million CHF and ‘*Time to Maturity*’ is less than 1 year then ‘*Liquidity Status’* is classified as Low Liquid with ‘*Liquidity Reason’* as “7b - PriceFeed(ok) and MediumPositionSize (1.5 <= x <= 5) but WeakRating (NonIG) but [SmallerIssueAmt (< 400mn) or ShortTtM (< 1 yr)]”.
* All Credit Relationship-Instrument pair which have been classified as ‘High Liquid’ as per above steps but have ‘*Liquidity Score*’ (from UBS DELTA) less than or equal to 6 are classified as illiquid with ‘*Liquidity Reason’* as “Instrument Liquidity Score <= 6”.
* All Credit Relationship-Instrument pair for which ‘*Liquidity Status*’ has been identified as either Illiquid, Medium Liquid or Low Liquid would have ‘*Final* *Liquidity Status*’ as Illiquid. For rest of the pairs ‘*Final* *Liquidity Status*’ would be Liquid.
* If Credit Relationship-Instrument pair’s Credit Relationship code is C17164 and ‘*Final* *Liquidity Status*’ is Illiquid, then override the ‘*Final* *Liquidity Status*’ to Liquid.
* Transfer the ‘*Final* *Liquidity Status*’ and all other measures from Credit Relationship-Instrument pair to Agreement level.

Workflow:





Output:

Following two files would be generated as output of Bond Liquidity Assessment Calculator.

1. Bond Liquidity Analytics File: This file contains all the instruments for all agreements along with its ‘*Liquidity Status’* and ‘*Liquidity Reason*’.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Agreement Code | Agreement Code |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| ISIN | ISIN of underlying instrument |
| Issuer Name | Issuer name of the underlying instrument |
| Total Underlying Quantity | Total Underlying Quantity |
| Total Underlying Amount | Total Underlying Amount in CHF (i.e. Total Notional in CHF) |
| Total Outstanding Bond of the issuer | Total Outstanding Bond of the issuer in CHF |
| Bond Outstanding Amount | Bond Outstanding Amount of the underlying instrument in CHF |
| Ownership Percentage | Ownership Percentage of the Client Position |
| Nominal Value | Nominal Value of the underlying instrument |
| Nominal Currency | Nominal Currency of the underlying instrument |
| Value Date | Value Date of the Price of Underlying Instrument |
| Dirty Mid Price | Dirty Mid Price of the underlying |
| Dirty Mid Price Currency | Currency code for Price of the Instrument |
| Age of Price | Age of Price for underlying Instrument |
| Maturity Date | Maturity Date of the underlying Instrument |
| Time to Maturity | Time to Maturity of the underlying Instrument |
| Rating Value | Rating Value of the underlying Instrument (Worst Rating in case of multiple ratings) |
| Rating Grade | Rating Grade of the underlying Instrument |
| ABS/MBS Instrument identifier | ABS/MBS Instrument identifier |
| Liquidity Status | Liquidity Status of the underlying Instrument |
| Liquidity Score | Liquidity Score from UBS DELTA |
| Liquidity Reason | Liquidity Reason Description |
| Fallback Reason | Reason for falling back to default value |
| Final Liquidity Status | Final Liquidity Status |

1. Illiquid Bond File: This file will contain distinct agreements having Illiquid Bond Instrument.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Agreement Code | Agreement Code |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| ABS/MBS Instrument identifier | ABS/MBS Instrument identifier |
| Liquidity Status | Liquidity Status of the underlying Instrument |
| Liquidity Score | Liquidity Score from UBS DELTA |
| Liquidity Reason | Liquidity Reason Description |
| Fallback Reason | Reason for falling back to default value |
| Final Liquidity Status | Final Liquidity Status |

### HtR Step 1 Calculator

This calculator classifies Trade/Agreement as Hard to Replace (HtR) based on the Counterparty level stressed holding periods. Counterparty level stressed holding periods will be estimated by combining IB trading limits, Stress LAS holding periods, which is based on IB trading limits, and transaction Greeks (Delta) by portfolio segment and risk factor aggregated to counterparty level.

Input Datasets:

1. Trades/Positions
2. Trade Sensitivities
3. Liquidity Adjusted Stress Days
4. Delta Limits
5. Options Maturity Limit
6. Index Issuer Mapping

Data Selection:

* For Risk Categories EQ & IR
  + Select all Trade Sensitivities of OTC Portfolio
* For Risk Categories FX & PM
  + Select all Trade Sensitivities of OTC Portfolio
  + Exclude records where risk factor is a Currency Pair or PM Pair (e.g. USD/CHF or XAU/EUR)
* For Risk Categories CR\_Sov
  + Select all Trade Sensitivities of OTC Portfolio for which Risk Category is CR and ‘*Reference Entity Govt Flag’* is ‘Y’
* For Risk Categories CR\_Index
  + Select all Trade Sensitivities of OTC Portfolio for which Risk Category is CR and ‘*Reference Entity Index Flag’* is ‘Y’
  + Derive the Risk Factor of Index using the mapping of reference entity name and Index
* For Risk Categories CR\_Corp
  + Select all Trade Sensitivities of OTC Portfolio for which Risk Category is CR and ‘*Reference Entity Govt Flag’* is not ‘Y’ and also ‘*Reference Entity Index Flag’* is not ‘Y’

Computation Rules:

Following intermediate measures are to be computed before applying rules for HtR Under Stress.

| **Measure Name** | **Input Dataset** | **Input Attributes** | **Derivation Logic** |
| --- | --- | --- | --- |
| Product Risk Factor | Trade | Option Type | If ‘*Option Type*’ in (P, C, S) then concatenation of “Opt\_” & ‘*Risk Category*’ else concatenation of “D1\_” & ‘*Risk Category*’ |
| Trade Sensitivities | Risk Category |
| Residual Maturity | Trade | Maturity Date | Maturity Date – Business Date |
| Aggregated Absolute Delta | Trade Sensitivities | Delta USD | For each Credit Relationship – Product Risk Factor |
| Pseudo Holding Period | Trade Sensitivities | Aggregated Absolute Delta | For each Credit Relationship – Product Risk Factor |
| Delta Limits | Limit USD |
| Liquidity Adjusted Stress Days | LAS Days |

*Data Gap Handling*:- For missing value of attributes following fallback values would be used.

* If ‘*Maturity Date’* is blank/null or not available for a trade then default the value to ’31-Dec-2099’
* All Risk factors which are not available in Delta Limits or Liquidity Adjusted Holding Period, use the values corresponding to proxy risk factor ‘OTH’.

Following rules are applied for HTR Assessment.

* For all trades, If ‘*Pseudo Holding Period*’ > 10 then HTR\_Stressed is “Y” else “N”.
* For Option Trades (i.e. for trades with ‘*Options Type’* as either P, C or S), If ‘*Residual Maturity*’ > Maturity Limit then HTR\_Stressed is “Y” else “N”.

Workflow:



Outputs:

HtR Step1 Calculator will produce only one output file that will contain all Credit Relationship code which are Identified as HTR\_Stressed as “Y”. Output attributes are as below.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| Product Risk Factor | Product Risk Factor |
| HTR\_Stressed | Hard to Replace under Stress indicator |

### HtR Step 2 Calculator

This calculator identifies Hard-to-Replace derivative based on the characteristics of the transactions (vanilla, exotic etc.) as well as the underlying of the transaction.

Input Datasets:

1. Trades/Positions
2. TV Diff Mapping
3. Credit Curve Quotes Count
4. Bond Liquidity Analytics File
5. Equity Liquidity Analytics File

Data Selection:

* Select all trades of OTC portfolio

Computation Rules:

Following intermediate measures are to be computed before applying rules for HtR Under Stress.

| **Measure Name** | **Input Dataset** | **Input Attributes** | **Derivation Logic** |
| --- | --- | --- | --- |
| Product Classification String | Trade | Trade Type | For each Trade  If ‘*Trade Sub Type*’ is null then Upper(‘*Trade Type*’)||”#<unset>#”|| ‘*System Trade Type*’  Else If ‘*Trade Sub Type*’ = “CMT Option” then “CMTOPTION#<unset>#”|| ‘*System Trade Type*’  Else Upper(‘*Trade Type*’)||’*Trade Sub Type*’|| ‘*System Trade Type*’ |
| Trade Sub Type |
| System Trade Type |
| Product Category | Trade  Trade | Product Classification String | For each Trade  If ‘*Product Code*’ is not (EIOP, EISW, EQOP, EQSW, PRSWS) then  fetch Product category from TV Diff Mapping file using ‘*Product Classification String*’  If not found then fetch Product category from TV Diff Mapping file using ‘*Product Code*’  If ‘*Product Classification String*’ contains “FXSWAP” then set the product category as “Vanilla FX”  If ‘*Product Classification String*’ contains “MONTECA” then set the product category as “Exotic FX”  Else  If ‘*Product Classification String*’ contains “EXOTIC” or “UNSUPPORTED” or “VARSW” then set the product category as “Exotic Equities”  Else set the product category as “Vanilla Equities” |
| Product Code |
| TV Diff Mapping | Product Classification |
| Product Category2 | Trade | Product Category | If ‘*Product Category*’ contains “Exotic” the set ‘*Product Category2*’ as “Exotic” else “Vanilla” |
| Illiquid Equity Indicator | Trade | Underlying Instrument Code | If ‘*Underlying Instrument Code*’ of Trade is present in Equity Liquidity Analytics File with ‘Final Liquidity Status’ as Illiquid then “Yes”  Else “NA” |
| Equity Liquidity Analytics File | Underlying Instrument Code |
| Illiquid Bond Indicator | Trade | Underlying Instrument Code | If ‘*Underlying Instrument Code*’ of Trade is present in Bond Liquidity Analytics File with ‘Final Liquidity Status’ as Illiquid then “Yes”  Else “NA” |
| Bond Liquidity Analytics File | Underlying Instrument Code |
| Illiquid Credit Underlying | Trade | Trade Code | If ‘*Reference* *Instrument Code*’ of Trade is present in Bond Liquidity Analytics File with ‘Final Liquidity Status’ as Illiquid then “Yes”  Else “NA” |
| Credit Default Swap | Trade Code |
| Credit Default Swap | Reference Instrument Code |
| Bond Liquidity Analytics File | Underlying Instrument Code |
| Big Six Currency Indicator | Trade | Underlying Risk Driver | If Currency pair of ‘Underlying Risk Driver’ are from Big Six Currencies (i.e. USD, CHF, GBP, EUR, JPY, AUD) then “Yes”  Else “No” |
| Industrialized Currencies Indicator | Trade | Underlying Risk Driver | If Currency pair of ‘Underlying Risk Driver’ are from Industrialized Currencies (i.e. USD, CHF, GBP, EUR, JPY, AUD, CAD, DKK, NZD, NOK, SEK) then “Yes”  Else “No” |
| Credit Curve Name | Trade | Underlying Risk Driver | Extract the string after the word “Credit:” and before “;” or end of line |
| Illiquid Credit Curve Indicator | Credit Curve Quote Count | Brokers Count | If ‘*Brokers Count*’ <= 2 then “Yes” else “NA” |
| Trade | Credit Curve Name |

Apply following rules for HtR assessment of the trade.

* If ‘*Product Category2*’ is “Exotic” then HtR Status = “Y”
* If ‘*Product Category*’ is “Vanilla FX” and ‘*Industrialized Currencies Indicator*’ is “No” then HtR Status = “Y”
* If ‘*Underlying Risk Driver*’ has “FX” as risk driver and ‘*Big Six Currency Indicator*’ is “No” then HtR Status = “Y”
* If ‘*Illiquid Equity Indicator*’ is “Yes” then HtR Status = “Y”
* If ‘*Illiquid Bond Indicator*’ is “Yes” then HtR Status = “Y”
* If ‘*Illiquid Credit Underlying Indicator*’ is “Yes” then HtR Status = “Y”
* If ‘*Illiquid Credit Curve Indicator*’ is “Yes” then HtR Status = “Y”
* Else HtR Status = “N”

Workflow:





Outputs:

Following two files would be generated as output of Equity Liquidity Assessment Calculator.

1. HtR Trade Level Analytics File: This file contains all trades with its ‘*HtR Status*’.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Agreement Code | Agreement Code |
| Trade Code | Trade Code |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| Trade Type | Trade Type |
| Trade Sub Type | Trade Sub Type |
| System Trade Type | System Trade Type |
| Product Code | Product code of the trade |
| Product Classification String | Product Classification String |
| Underlying Risk Drivers | Underlying Risk Drivers of Trade |
| Product Category | Product Category as derived in the calculator |
| Product Category2 | Product Category2 as derived in the calculator |
| Big Six Currencies Indicator | Flag to indicate if the Currency pair contains currencies from Big Six Currencies |
| Industrialized Currencies Indicator | Flag to indicate if the Currency pair contains currencies from Industrialized Currencies |
| Underlying Instrument code | Underlying Instrument code |
| Illiquid Equity Indicator | Flag to indicate if underlying instrument is an Illiquid Equity Instrument |
| Illiquid Bond Indicator | Flag to indicate if underlying instrument is an Illiquid Bond Instrument |
| Credit Underlying | Reference Instrument code of Credit Default Swap |
| Credit underlying Issuer Name | Credit underlying Issuer Name |
| Illiquid Credit underlying Indicator | Flag to indicate if Credit underlying instrument is an Illiquid Bond Instrument |
| Credit Curve Name | Credit Curve Name extracted from Underlying Risk Driver |
| Illiquid Credit Curve Indicator | Flag to indicate if Credit Curve is an Illiquid Credit Curve |

1. HtR Step2 Counterparty File: This file will contain Agreements having Trade with HtR Status = “Y”.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Agreement Code | Agreement Code |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| HtR Status | HtR Status of Trade |

### MPR Calculator

Input Datasets:

1. Agreements
2. Agreement Trade Count
3. Trade/Positions
4. Collateral
5. Illiquid Equity File
6. Illiquid Bond File
7. Hard to Replace under Stress File
8. HtR Step2 Counterparties
9. Level 3 Transactions
10. Margin Disputed Agreements
11. Client Relationship Details
12. Party Details

Data Selection:

* Select Agreement Trade Count for all Traded Product Portfolios (i.e. OTC, SFT, ETD\_CLEARED, OTC\_CLEARED)

Computation Rules:

Following measures are to be computed.

| **Measure Name** | **Input Dataset** | **Input Attributes** | **Derivation Logic** |
| --- | --- | --- | --- |
| NCCP Broker Facing ETD Flag | Trade | Portfolio Code | NCCP Facing Agreements:   1. ETD\_CLEARED Trades with counterparties having ‘*Portfolio Segment*’ as “CLN” are the NCCP trades 2. ETD\_CLEARED Agreements which are not with NCCP or QCCP counterparties (i.e. ‘*Portfolio Segment*’ of the Counterparty is not in (“CLN”, “CLQ”)) but share the same ‘*Underlying Instrument Code*’ with NCCP trades (as identified in step i above) are identified as ‘*NCCP Broker Facing ETD Flag*’ = “Y”   Broker Facing Agreements:   1. ETD\_CLEARED Trades with ‘*Relationship Type*’ as “BRETD” are the Broker trades 2. ETD\_CLEARED Agreements from ‘*UBS Branch*’ 850 which have ‘*Relationship Type*’ as “CLETD” and share the same ‘Underlying Instrument Code’ as Broker trades (as identified in step i above) are identified as ‘*NCCP Broker Facing ETD Flag*’ = “Y” |
| Underlying Instrument Code |
| Relationship Type |
| UBS Branch Code |
| Client Relationship Details | Party Code |
| Party Details | Portfolio Segment |
| Agreement Trade Count | Agreement Code |
| Greater Than 5000 Trades Flag | Agreement Trade Count | Trade Count | If ‘*Portfolio Segment*’ <> “CLQ” and ‘*Trade Count*’ > 5000 then “Y” else “N” |
| Client Relationship Details | Party Code |
| Party Details | Portfolio Segment |
| Illiquid Collateral Flag | Illiquid Bond File | Agreement Code | If ‘*Agreement Code*’ is present in Illiquid Bond File then “Y”  Or  If ‘*Agreement Code*’ is present in Illiquid Equity File then “Y”  Or  If ‘*Agreement Code*’ is present in Level 3 Transactions for ‘*Portfolio Code*’ as “SFT” then “Y” |
|  | Illiquid Equity File | Agreement Code |
| Level 3 Transactions | Portfolio Code |
| Agreement Code |
| Agreement Trade Count | Agreement Code |
| HTR L3 Flag | Level 3 Transactions | Portfolio Code | If ‘*Agreement Code*’ is present in Level 3 Transactions for ‘*Portfolio Code*’ as “OTC” then “Y” |
| Agreement Code |
| Agreement Trade Count | Agreement Code |
| HTR Flag | Hard to Replace under Stress File | Credit Relationship Code | If ‘*Agreement Code*’ is present in HtR Step2 Counterparties then “Y”  Or  If ‘*Credit Relationship Code*’ is present in HtR Step2 Counterparties then “Y” |
| HtR Step2 Counterparties | Agreement Code |
| Agreement Trade Count | Agreement Code |
| Credit Relationship Code |
| Valid Margin Dispute | Margin Disputed Agreements | Dispute Start Date | If ‘*Latest Age of Dispute*’ < 7 or [*Current Business Date* – (‘*Dispute Start Date*’ + ‘*Latest Age of Dispute*’ - 1)] >180  Then “N”  Else “Y” |
| Latest Age of Dispute |
| Margin Dispute Count Greater Than 7 Days | Margin Disputed Agreements | Credit Relationship Code | Count of Valid Margin Disputes for Credit Relationship Code across all portfolios with ‘*Latest Age of Dispute*’ > 7 |
| Latest Age of Dispute |
| Margin Dispute Count Greater Than 15 Days | Margin Disputed Agreements | Credit Relationship Code | Count of Valid Margin Disputes for Credit Relationship Code across all portfolios with ‘*Latest Age of Dispute*’ > 15 |
| Latest Age of Dispute |
| Margin Dispute Count Greater Than 30 Days | Margin Disputed Agreements | Credit Relationship Code | Count of Valid Margin Disputes for Credit Relationship Code across all portfolios with ‘*Latest Age of Dispute*’ > 30 |
| Latest Age of Dispute |
| Applicable MPR | Agreement Trade Count | Portfolio Code | If ‘*Greater Than 5000 Trades Flag*’ =”Y” or ‘*Illiquid Collateral Flag*’ = “Y” or ‘*HTR L3 Flag*’ = “Y” or ‘*HTR Flag*’ = “Y”  Then 30  Else  If ‘*Portfolio Code*’ = “OTC” or ‘*Netting Agreement Type*’ = “ISDA PB” or ‘*Portfolio Segment*’ is either “CLN” or“CLQ” or ‘*NCCP Broker Facing ETD Flag*’ = “Y”  then 15  Else 7 |
| Netting Agreement Type |
| NCCP Broker Facing ETD Flag |
| Greater Than 5000 Trades Flag |
| Illiquid Collateral Flag |
| HTR L3 Flag |
| HTR Flag |
| Party Details | Portfolio Segment |
| MPR Floor Comment | Agreement Trade Count | Portfolio Code | If ‘*Greater Than 5000 Trades Flag*’ = “Y” Then “LARGER THAN 5000 TRADES”  &  If ‘*Illiquid Collateral Flag*’ = “Y” Then “ILLIQUID COLLATERAL”  &  If ‘*HTR L3 Flag*’ = “Y” Then “HTR L3”  &  If ‘*HTR Flag*’ = “Y” Then “HTR STRESSED”  &  If ‘*Portfolio Segment*’ is either “CLQ” Then “CCP”  &  If ‘*NCCP Broker Facing ETD Flag*’ = “Y” then “NCCP Facing” |
| Netting Agreement Type |
| NCCP Broker Facing ETD Flag |
| Greater Than 5000 Trades Flag |
| Illiquid Collateral Flag |
| HTR L3 Flag |
| HTR Flag |
| Party Details | Portfolio Segment |
| Margin Period of Risk | Margin Disputed Agreements | Margin Dispute Count Greater Than 7 Days | If ‘*Applicable MPR*’ = 7 and ‘*Margin Dispute Count Greater Than 7 Days*’ > 2 then  15 + (‘*Margin Frequency*’ -1)  Else If ‘*Applicable MPR*’ = 15 and ‘*Margin Dispute Count Greater Than 15 Days*’ > 2 then  30 + (‘*Margin Frequency*’ -1)  Else If ‘*Applicable MPR*’ = 30 and ‘*Margin Dispute Count Greater Than 30 Days*’ > 2 then  60 + (‘*Margin Frequency*’ -1)  Else  ‘*Applicable MPR*’ + (‘*Margin Frequency*’ -1) |
| Margin Dispute Count Greater Than 15 Days |
| Margin Dispute Count Greater Than 30 Days |
| Agreement | Margin Frequency |
| Margin Dispute Count | Margin Disputed Agreements | Margin Dispute Count Greater Than 7 Days | If ‘*Applicable MPR*’ = 7 and ‘*Margin Dispute Count Greater Than 7 Days*’ > 2 then  *Margin Dispute Count Greater Than 7 Days*  Else If ‘*Applicable MPR*’ = 15 and ‘*Margin Dispute Count Greater Than 15 Days*’ > 2 then  *Margin Dispute Count Greater Than 15 Days*  Else If ‘*Applicable MPR*’ = 30 and ‘*Margin Dispute Count Greater Than 30 Days*’ > 2 then  *Margin Dispute Count Greater Than 30 Days* |
| Margin Dispute Count Greater Than 15 Days |
| Margin Dispute Count Greater Than 30 Days |
| Final MPR Comments | Agreement | Margin Frequency | If ‘*Margin Dispute Count*’ > 2 then “MARGIN CALL DISPUTE”  &  If Margin Frequency !=1 then “NON-DAILY MARGIN” |
| MPR Type | Agreement Trade Count | Portfolio Code | If ‘*Portfolio Code*’ = “OTC” and ‘*Margin Period of Risk*’ <=15 then “R”  Else “E”  If ‘*Portfolio Code*’ = “SFT” and ‘*Margin Period of Risk*’ <=7 then “R”  Else “E”  If ‘*Portfolio Code*’ = “ETD” and ‘*Margin Period of Risk*’ =30 then “E”  Else “R”  If ‘*Portfolio Code*’ = “ETD\_CLEARED” and ‘*Margin Period of Risk*’ =30 then “E”  Else “R”  If ‘*Portfolio Code*’ = “OTC\_CLEARED” and ‘*Margin Period of Risk*’ =30 then “E”  Else “R” |
|  |  | Margin Period of Risk |
| Exposure Type | Agreement Trade Count | Portfolio Code | If ‘*Portfolio Code*’ = “OTC” then “OTCC”  Else If ‘*Portfolio Code*’ = “SFT” then “SFTR”  Else If ‘*Portfolio Code*’ = “ETD” then “ETDC”  Else If ‘*Portfolio Code*’ = “ETD\_CLEARED” then “ETDC”  Else If ‘*Portfolio Code*’ = “OTC\_CLEARED” then “OTCC” |
| Reason Code | Agreement Trade Count | MPR Floor Comment | Assign Reason Code as per mapping table. |
| Margin Start Date |  |  | Business Date – 180 Days |
| Margin End Date |  |  | Business Date + 180 Days |

| **MPR Floor Comment** | **MPR Final Comment** | **Reason Code** |
| --- | --- | --- |
| N/A | N/A | 00 |
| LARGER THAN 5000 TRADES | N/A | 01 |
| ILLIQUID COLLATERAL | N/A | 02 |
| HTR | N/A | 03 |
| LARGER THAN 5000 TRADES & ILLIQUID COLLATERAL | N/A | 04 |
| LARGER THAN 5000 TRADES & HTR | N/A | 05 |
| ILLIQUID COLLATERAL & HTR | N/A | 06 |
| CCP | N/A | 08 |
| N/A | CLEARING CLIENT | 07 |
| N/A | MARGIN CALL DISPUTE | 09 |
| N/A | NON-DAILY MARGIN | 10 |

Workflow:





Outputs:

Two output files would be generated by the MPR Calculator.

1. MPR Analytics File: This file contains all the agreements along with Margin Period of Risk and intermediate measures.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Agreement Code | Netting Agreement Code |
| Agreement Type | Netting Agreement Type |
| Portfolio Code | Portfolio code of the Agreement/Trades |
| Ultimate Parent Credit Relationship Code | Ultimate Parent of the Counterparty |
| Party Code | Party Code (CCONSOL) of the counterparty |
| Party Source System | Source System of the Party code |
| Portfolio Segment Code | Portfolio Segment code of the counterparty |
| Margin Frequency | Margin Call Frequency for the Collateral Agreement |
| Greater Than 5000 Trades Flag | Flag to indicate if the Netting agreement contains more than 5000 trades in past 90 days |
| Illiquid Collateral Flag | Flag to indicate that Netting agreement contain Illiquid Collateral |
| HTR Flag | Flag to indicate that Netting agreement contain Hard to Replace Trade |
| HTR L3 Flag | Flag to indicate that Netting agreement contain trade which is a level 3 trade |
| NCCP Broker Facing ETD Flag | Flag to Indicate that ETD Netting Agreement contains trade which is facing either NCCP or Broker |
| Relationship Type | Relationship Type of Trades within Netting Agreement |
| Margin Dispute Count Greater Than 7 Days | Count of Valid Margin Disputes for which age of dispute is more than 7 days |
| Margin Dispute Count Greater Than 15 Days | Count of Valid Margin Disputes for which age of dispute is more than 15 days |
| Margin Dispute Count Greater Than 30 Days | Count of Valid Margin Disputes for which age of dispute is more than 30 days |
| Applicable MPR | Applicable MPR for the Netting Agreement |
| Margin Period of Risk | Margin Period of risk for the Netting Agreement |
| MPR Floor Comments | Comments for assigning Applicable MPR |
| Final MPR Comments | Comments for assigning Final MPR |

1. MPR File: This file will contain agreements having Illiquid Bond Instrument.

| **Column Name** | **Description** |
| --- | --- |
| Business Date | Business Date for which calculator has been run |
| Party Code | Party Code (CCONSOL) of the counterparty |
| Party Source System | Source System of the Party code |
| Credit Relationship Code | Credit Relationship code of the counterparty |
| Ultimate Parent Credit Relationship Code | Ultimate Parent of the Counterparty |
| Agreement Code | Agreement Code |
| Unique Trade Code | Blank Column |
| Unique Trade System Code | Blank Column |
| Trade Code | Blank Column |
| Leg Number | Blank Column |
| Trade System Code | Blank Column |
| Margin Period of Risk | Margin Period of Risk of the Agreement |
| Margin Dispute Count | Count of Margin Disputes |
| Margin Start Date | Margin Start Date |
| Margin End Date | Margin End Date |
| Reason Code | Reason Code |
| Owner Employee GPN | Blank Column |
| Exposure Type | Exposure Type |
| MPR Type | MPR Type (E: Extended, R: Regular) |
| Relationship Type | Relationship Type of Trade |

# Open Questions

| **No.** | **Calculator** | **Descriptions** | **Owner** | **Status** | **Remark** |
| --- | --- | --- | --- | --- | --- |
| OI1 | Bond Liq Assessment | Flag UBSL\_FLAG is not used anywhere in the EUA. Do we need this attribute? Do we have a requirement to report MPR of UBSL agreements separately? | Steven Hunter | Closed | 23-Sep: (SH) Attribute can be dropped. It was need in the old implementation of EUA. Now not needed. |
| OI2 | Bond Liq Assessment | What’s rationale of additional filter based on INSTRUMENT\_DRIVEN\_PRODUCT\_CODE? | Steven Hunter | Closed | 23-Sep: (SH) Filter was included in EUA as sometimes PRODUCT\_CODE of the trade is BOFO or BOPO but the actual underlying instrument is an equity instrument. |
| OI3 | Bond Liq Assessment | Can we use INSTRUMENT\_TYPE or ISO\_CLASSIFICATION\_TYPE for identification of trades with Bond/Equity as underlying? | Steven Hunter | Closed | 23-Sep: (SH) We can use INSTRUMENT\_TYPE or ISO\_CLASSIFICATION\_TYPE to identify trades with Bonds underlying, provided using INSTRUMENT\_TYPE/ISO\_CLASSIFICATION\_TYPE ensures correct and adequate trade population coverage.  29-Oct: (NS) on data analysis it was found that there are many instruments for which INSTRUMENT\_TYPE and ISO\_CLASSIFICATION\_TYPE is not available. Hence existing logic of EUA provides better coverage of Trade Population. |
| OI4 | Bond Liq Assessment | Currently EUA filters out trade for which EMTM\_VALUE is 0. What’s the rationale for excluding such trades? | Steven Hunter | Closed | 23-Sep: (SH) Its used to filter out already matured trades. This condition can be removed to make it inline with Equity Liq assessment. |
| OI5 | Bond Liq Assessment | LEGAL\_AGREEMENT\_CODE is extracted but not used in Bond EUA. Is this data (Legal Agreement code) redundant for Bond Liquidity Assessment? | Steven Hunter | Closed | 23-Sep:(SH) Its redundant now for Bond EUA. |
| OI6 | Bond Liq Assessment | What was the rationale for not sourcing all collateral data from Zeus? | Steven Hunter | Closed | 23-Sep: (SH) Collateral Information in ZEUS is not fit for use. Specially for ETD\_CLEARED.  Explore if collateral data of Zeus is good in comparison to RRS, if Zeus data is to be used. Dmitrii Kharitonov has done some analysis in the past in this direction. He may be able to help. 23-Nov: (NS) While comparing the Collateral data of ETD\_CLEARED from Zeus and RRS (for 30-Sep-2020) it was found that Zeus has collateral Data which is matching with RRS. Zeus does not have UNDERLYING\_AMOUNT (i.e. quantity of underlying instrument) for ETD\_CLEARED collateral records, however it has NOTIONAL\_AMOUNT, which can be used. |
| OI7 | HtR Step 1 EUA | Why SFT are not covered for HtR Step 1 EUA? | Steven Hunter | Closed | 30-Sep: (SH) HtR is only relevant for OTC. For SFT its not applicable. |
| OI8 | HtR Step 1 EUA | What’s the source of Liquidity Adjusted Stress days? | Steven Hunter | Closed | 30-Sep: (SH) Its being updated annually from SharePoint Site. Recommendation is to make it configurable . |
| OI9 | HtR Step 1 EUA | What’s the source of Delta Limits? | Steven Hunter | Closed | 30-Sep: (SH) it’s being sourced from ARISK. It’s being updated annually. Recommendation is to make it configurable . |
| OI10 | MPR EUA | What’s the rationale of taking the trade count of ETD\_CLEARED agreements again using Merival Data. | Steven Hunter | Open | 30-Sep: (SH) It should be unified.  (NS) Following note was given in SOP for this workaround.  "*There is a known issue with the ETD trades count in this file. The count is performed at trade level, however for ETD we should run this at a position level (similar to the trade count view in Iris). To identify the correct netting sets that should have over 5k position trade\_count is taken from Merival*." |
| OI11 | MPR EUA | Why LED Margin frequencies are being sourced additionally on top of Margin Frequency received from ZEUS. | Steven Hunter | Closed | 30-Sep: (SH) Check with Tony. This process should be unified. LED margin frequency may not be necessary. Zeus data may be sufficient. Verify it once.  23-Nov: (NS) Zeus will source margin frequency from LED through Daytona. |
| OI12 | MPR EUA | What’s rationale of relying on Merival data for identifying NCCP facing trades? | Steven Hunter | Open | 30-Sep: (SH) Unify the logic using Zeus Data. Explore if logic used for identification of “Broker facing trades” be used for identification of “NCCP facing Trades” |
| OI13 | MPR EUA | Do we need to source Instrument Ratings additionally form SSC? | Steven Hunter | Closed | 30-Sep: (SH) This process should be unified. SSC Bond rating may not be necessary. Zeus data may be sufficient. Verify it once.  23-Nov: (NS) Prima-facie ZEUS has a good coverage of Instrument Ratings. |
| OI14 | MPR EUA | What is the definition of NCCP facing trades. How it can be identified. | Steven Hunter | Open |  |
| OI15 | MPR EUA | What is the definition of Broker facing trades. How it can be identified. | Steven Hunter | Open |  |

# Appendix

## Data Attribute Analysis

Attached sheet contains a consolidated list of attributes being consumed by MPR EUAs, along with normalized Data attributes which forms the basis for Data requirement.



## Data Gaps

Attached excel highlights the Data-Gaps which needs to be addressed in order to ensure complete coverage of Data or implementation of MPR solution.



## Rating Grade Matrix

| **External Rating** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Moody's** | | **S&P** | | **Fitch** | | **Ranking** | **Rating Grade** |
| **Long Term** | **Short Term** | **Long Term** | **Short Term** | **Long Term** | **Short Term** |
| Aaa | P1 | AAA | A-1+ | AAA | F1+ | 1 | IG |
| Aa1 | AA+ | AA+ | 2 |
| Aa2 | AA | AA | 3 |
| Aa3 | AA- | AA- | 4 |
| A1 | A+ | A-1 | A+ | F1 | 5 |
| A2 | A | A | 6 |
| A3 | P-2 | A- | A-2 | A- | F2 | 7 |
| Baa1 | BBB+ | BBB+ | 8 |
| Baa2 | P-3 | BBB | A-3 | BBB | F3 | 9 |
| Baa3 | BBB- | BBB- | 10 |
| Ba1 |  | BB+ | B | BB+ | B | 11 | Non-IG |
| Ba2 |  | BB | BB | 12 |
| Ba3 |  | BB- | BB- | 13 |
| B1 |  | B+ | B+ | 14 |
| B2 |  | B | B | 15 |
| B3 |  | B- | B- | 16 |
| Caa1 |  | CCC+ | C | CCC+ | C | 17 |
| Caa2 |  | CCC | CCC | 18 |
| Caa3 |  | CCC- | CCC- | 19 |
| Ca |  | D | D | DDD | D | 20 |
| C |  |  |  | DD | 21 |
|  |  |  |  | D | 22 |

IG = Investment Grade Rating

Non-IG = Non-Investment Grade Rating

## Known Differences

### Data Source

Following table depicts the comparison of Data Sources EUAs Vs To be Solution. Yellow highlighted rows are the data source which are different.

| **#** | **Calculator** | **Data Entity** | **Portfolio** | **EUA** | **To Be Solution** | **Remark** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | Equity Liquidity Assessment | Trade | OTC | ZEUS | ZEUS |  |
| 2 | Equity Liquidity Assessment | Trade | SFT | ZEUS | ZEUS |  |
| 3 | Equity Liquidity Assessment | Trade Risk Measurement | OTC | ZEUS | ZEUS |  |
| 4 | Equity Liquidity Assessment | Trade Risk Measurement | SFT | ZEUS | ZEUS |  |
| 5 | Equity Liquidity Assessment | Collateral | OTC | ZUES | ZEUS |  |
| 6 | Equity Liquidity Assessment | Collateral | SFT | ZUES | ZEUS |  |
| 7 | Equity Liquidity Assessment | Collateral | ETD\_CLEARED | RRS | ZEUS |  |
| 8 | Equity Liquidity Assessment | Instrument Static |  | ZEUS | ZEUS |  |
| 9 | Equity Liquidity Assessment | Instrument Price |  | RiskView | ZEUS |  |
| 10 | Equity Liquidity Assessment | Exchange Rate |  | ZEUS | ZEUS |  |
| 11 | Bond Liquidity Assessment | Trade | OTC | ZEUS | ZEUS |  |
| 12 | Bond Liquidity Assessment | Trade | SFT | ZEUS | ZEUS |  |
| 13 | Bond Liquidity Assessment | Trade Risk Measurement | OTC | ZEUS | ZEUS |  |
| 14 | Bond Liquidity Assessment | Trade Risk Measurement | SFT | ZEUS | ZEUS |  |
| 15 | Bond Liquidity Assessment | Collateral | OTC | ZUES | ZEUS |  |
| 16 | Bond Liquidity Assessment | Collateral | SFT | ZUES | ZEUS |  |
| 17 | Bond Liquidity Assessment | Collateral | ETD\_CLEARED | RRS | ZEUS |  |
| 18 | Bond Liquidity Assessment | Instrument Static |  | ZEUS | ZEUS |  |
| 19 | Bond Liquidity Assessment | Instrument Price |  | ZEUS | ZEUS |  |
| 20 | Bond Liquidity Assessment | Instrument Rating |  | ZEUS | ZEUS |  |
| 21 | Bond Liquidity Assessment | Instrument Rating |  | SSC | ZEUS |  |
| 22 | Bond Liquidity Assessment | Instrument Liquidity Score |  | UBS Delta (Confluence) | UBS Delta (Confluence) |  |
| 23 | HtR Step 1 | Trade Sensitivities |  | ZEUS MIS | ZEUS |  |
| 24 | HtR Step 1 | Liquidity Adjusted Stress Days |  | Manual | Manual |  |
| 25 | HtR Step 1 | Delta Limits |  | Manual | Manual |  |
| 26 | HtR Step 1 | Options Maturity Limits |  | Manual | Manual |  |
| 27 | HtR Step 1 | Index Issuer Mapping |  | Manual | Manual |  |
| 28 | HtR Step 2 | Trade | OTC | ZEUS | ZUES |  |
| 29 | HtR Step 2 | TV Diff Mapping | OTC | RA | RA |  |
| 30 | HtR Step 2 | Credit Curve Quote Count |  | Manual | Manual |  |
| 31 | MPR | Agreement | All Portfolios | LED | ZEUS | Zeus will source LED Margin Frequency from Daytona. |
| 32 | MPR | Agreement Trade Count | OTC | ZEUS | ZEUS |  |
| 33 | MPR | Agreement Trade Count | SFT | ZEUS | ZEUS |  |
| 34 | MPR | Agreement Trade Count | ETD\_CLEARED | Merival | ZEUS |  |
| 35 | MPR | Agreement Trade Count | OTC\_CLEARED | Merival | ZEUS |  |
| 36 | MPR | Level 3 Transaction | OTC | Merival | Merival |  |
| 37 | MPR | Level 3 Transaction | SFT | Merival | Merival |  |
| 38 | MPR | Margin Disputed Agreement |  | Manual | Manual |  |

### Calculation Logic/Data Coverage

1. Currently EUA does not consider Non Netted Transactions. Proposed Solution would consider Non Netted transactions in all calculations.