DSB ToTV and uToTV Functionality

Functional Specification Document

Author: Derivatives Service Bureau
Date: 20 September 2017
Version: **1.2**

Contents

Preface

Change History

Date	Change	Version	Author	Revision Details
27 May 2017	Creation	1.0	Kuhan T	
9 August 2017	Update	1.1	Natalia Kozlovich	Incorporated Industry feedback and added detailed workflows
20 September 2017	Update	1.2	Natalia Kozlovich	An update on items that were previously under analysis, open questions, and additional details of ongoing analysis

1 Introduction

1.1 Document Purpose

The purpose of this document is to set out the functional specification for extending the Derivatives Service Bureau (DSB) service to include Traded on a Trading Venue (ToTV) and underlying Traded on a Trading Venue (uToTV) indicators as requested by the industry via the Product Committee and broader consultation.

The previous version of ToTV and uToTV Functional Specification Document (v1.1) published on 9 August 2017 sought to clarify workflows based on commentary received by the DSB in the course of the consultation process.

This version of the document:

- provides an update on items that were previously under analysis (sections 1.3 and 1.5)
- sets out additional detail where this is available as a result of ongoing analysis
- seeks industry feedback on five open questions (section 1.6):
    a. Timing for the intra-day provision of ToTV/MiFID II data
    b. Provision of a complete FIRDS Reference Data record at the MIC level for both OTC and non-OTC ISINs
    c. Setting ToTV/uToTV as NULL until the instrument or underlying instrument is reported by at least one trading venue
    d. The ToTV JSON record structure
    e. Key DSB assumptions

1.2 Background

The DSB's core service is to provide ISINs for OTC derivatives. The key focus of this service extension is to assist with the process of identifying those ISINs that are Traded on a Trading Venue (ToTV) and those that have an underlying instrument that is Traded on a Trading Venue (uToTV).

In addition, the expectation is for ESMA's reference data system (FIRDS) to publish key ESMA attributes alongside each of the entries in the system and for ESMA to publish LIS and SSTI data as part of the transparency reporting system.

Many of the new business processes across the industry that require ISINs also use this ESMA published data. The DSB service aims to bring those different datasets together to facilitate the access to that data from a single source.

The DSB ToTV and uToTV indicators, as well as the other ESMA sourced data will be available alongside the ISIN in a separate JSON file as defined section 8.1 of this document. API users wishing to use the DSB's ToTV/ uToTV service will need to undertake development effort, while GUI users will be provided with ToTV/ uToTV information (at MIC level) via the DSB GUI.

The DSB should not to be treated as a golden source of ToTV or uToTV data and should be one input into a multi-factor determination by each user:

- The DSB's initial implementation of ToTV will be using FIRDS data as the only source to set the ToTV/uToTV values and ESMA has stated that FIRDS should not be used as the Golden Source.
- FIRDS data are only available at T+1, i.e. an instrument traded on a venue today, will only be marked as ToTV tomorrow when the processing of FIRDS data will have been completed.
- Trades or quotes that occur on a trading venue after 1800 on T+0 do not need to be reported as reference data which means, potentially, there will be products that are ToTV but will not be treated as such until T+2.
- The DSB uToTV indicator needs to be fully understood before being utilized by industry (section 4.3).

1.3 Response Highlights

The DSB received 23 responses to the draft functional specification - nine were questions about aspects of the document and 13 were focused on feedback. Feedback providers included one trade association, six sell-side organisations, four buy-side institutions and two vendors.

General feedback to each question raised in the previous ToTV and uToTV Functional Specification Document is set out below, with specific matters addressed in the body of this document.

Inclusion of non-OTC data: The previous paper asked whether the industry saw value in the DSB also providing ToTV information for non-OTC instruments so that the information would be available in a single place along with the rest of the service. Responses received: 31% agreed, 8% disagreed and 61% silent.
DSB Decision (9th Aug 2017): The DSB had previously committed to investigate the additional work required to undertake the provision of this data pool in addition to the core DSB OTC service.
Update (20th Sep 2017): The DSB will provide ToTV/MiFID II information for non-OTC instruments at the MIC level to enable users to make their own determination. The DSB defines non-OTC products as those not issued by the DSB, but received as part of the FIRDS Reference and Transparency files that are processed.

- Subject to industry feedback to the contrary (please refer to section 1.6.2), the DSB will provide a complete FIRDS Reference Data record for OTC instruments as part of the ToTV file in the same manner as for non-OTC ISINs.
- For Transparency Data (LIS, SSTI, Liquidity), the DSB will provide non-equity transparency results only on day 1 as equity transparency information is already available from other sources as a result of MiFID I.

Provision of sub-class: The previous paper asked whether the DSB should provide sub-class identification for OTC ISINs as part of the DSB ToTV service. Responses received: 23% agreed, 8% disagreed and 69% silent.
DSB Decision (9th Aug 2017): The DSB had previously committed to investigate the provision of sub-class, but as a low priority item. This means provision for Day 1 is unlikely.
Update (20th Sep 2017): The DSB assumption is that sub-class is not in the FIRDS Transparency data and if the assumption holds true, given the proximity of MiFIR Go Live, the time to run analysis on ways of sourcing this data is limited. As a result, the DSB will not provide sub-class identification as

part of the DSB ToTV service for Day 1, but will investigate the provision of sub-class in 2018, subject to prevailing industry demand.

Using FIRDS to determine ToTV indicators: The previous paper asked whether the FIRDS data should be the determinant of the DSB ToTV indicators. Responses received: 15% agreed, 15% disagreed and 70% were silent. Of the 15% of industry participants who disagreed, none suggested any alternative means of sourcing ToTV data.
DSB Decision (9th Aug 2017): The DSB will use the FIRDS data to determine the value of its ToTV/uToTV indicators (in the absence of a viable alternative for a service requested by industry) but remain mindful that additional sources may need to be incorporated at a future date once viable sources have been identified.

Core ToTV/ uToTV data attributes:

(i) The general feedback on the uToTV functionality was that if an Index has at least one constituent that is ToTV, an instrument with that index underlying will be uToTV.
(ii) A number of industry participants requested the inclusion of Effective Dates for ToTV/uToTV flags to identify the date on which an instrument first became eligible for reporting.

DSB Decision (9th Aug 2017): The DSB had previously committed to (a) implement uToTV functionality on the above basis, subject to ongoing analysis to accurately determine uToTV for OTC derivatives with index underlying products and (b) to provide Effective Dates for DSB ToTV/uToTV flags to reflect the feedback received.
Update (20th Sep 2017): The DSB will provide uToTV indicators for index and basket products where an ISIN has been provided as the underlying instrument. As the DSB does not have access to publicly available constituent data it is unable to undertake a constituent level uToTV review for index or basket OTC Derivatives.
Additionally, the DSB's proposed model assumes a one to one mapping between ToTV criteria and the ISIN, in light of ESMA's ToTV opinion of May 2017[1]. That is because the ISIN is more granular than all the other reference data fields together and the OTC-ISIN Product Definitions have been carefully designed to guarantee a many-to-one relationship between the OTC-ISIN and the remaining RTS23 reference data fields specified by the ESMA ToTV opinion. Therefore, to optimize the process, the DSB will be using the existence of an ISIN in FIRDS (for a valid MIC) as a proxy for determining the value of the ToTV/uToTV indicators and will not be performing a field by field matching of the other attributes specified in the ESMA opinion.

The DSB believes this is appropriate on the basis that the reference data for each ISIN will uniquely map to the relevant RTS23 fields 2-4 and 13-48 and therefore it is sufficient to compare only the ISIN value for the purpose of determining the ToTV flag. Any changes to this approach will need the DSB to revisit its technical architecture and may result in additional development effort and thus impact ToTV/ uToTV launch.

[1] https://www.esma.europa.eu/sites/default/files/library/esma70-156-117_mifir_opinion_on_totv.pdf?lipi=urn%3Ali%3Apage%3Ad_flagship3_pulse_read%3B2UW1B6S9T1S8RPucICSOSg%3D%3D

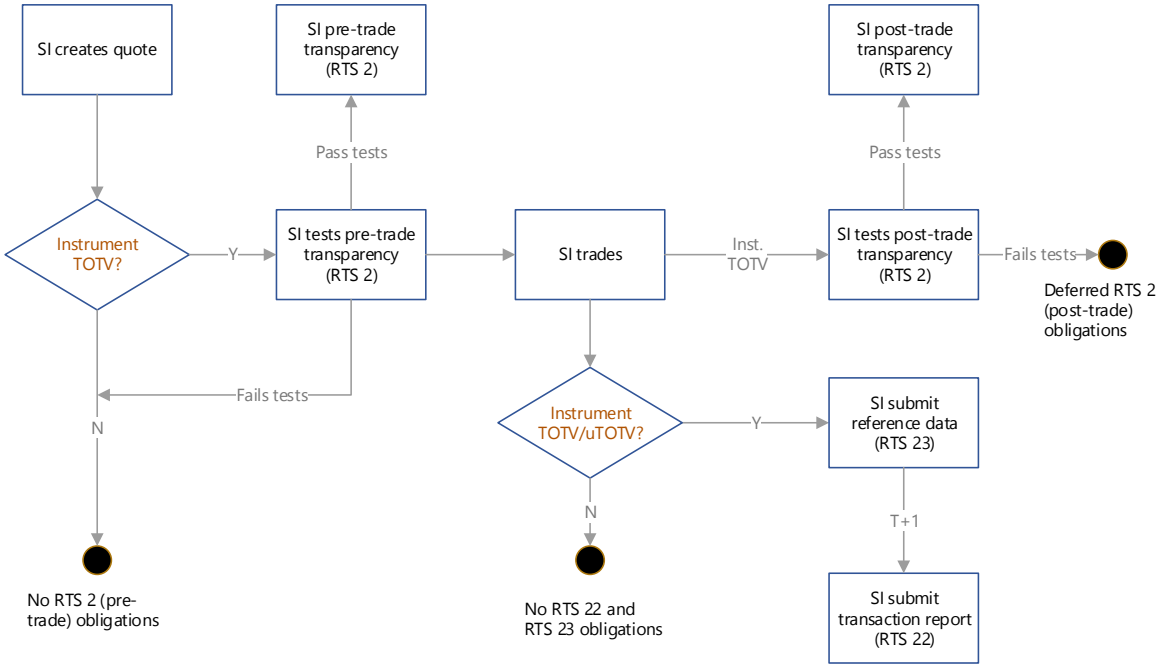
File Download timing: Several participants raised a concern about whether the file download provides ToTV information at a sufficient point in time for anyone using File Download as a single source of data of the ToTV information.

DSB Decision (9th Aug 2017): The DSB had committed to investigate the request, understand the impact on performance and the cost of making the file download available after the ToTV/uToTV flags have been computed.

Update (20th Sep 2017): Subject to industry demand in 2018, the DSB will perform analysis to determine whether additional file downloads can be made available on completion of the daily ToTV/ uToTV processing. This approach allows the DSB to limit the spectrum of changes required before January 2018 and to focus on delivery of the core ISIN functionality.

1.4 High Level Workflow

The diagram below is an example of one type of high level workflow for a Systematic Internalizer (SI) quoting and then trading an instrument, demonstrating some of the ways the ToTV flag might be used. This scenario is not to be treated as guidance or a comprehensive set of user workflows.



The test for ToTV at the pre-trade stage determines whether there are any MiFID II reporting or transparency obligations. The additional fields being considered for the MiFID II Dataset will provide the criteria for the pre-trade transparency tests.

The test for ToTV or uToTV at the post-trade stage determines whether there are any further MiFID II reporting or transparency obligations. The additional fields being considered for the MiFID II Dataset will provide the criteria for the post-trade transparency tests.

1.5 Previously Open Issues

This section describes items what were previously marked as open issues requiring clarity.

1.5.1 uToTV for Instruments where underlying includes one or more indices

For instruments with one or more underlying indices, the DSB's uToTV flag will be set to "true" if and only an ISIN for the index/basket is provided as part of the DSB OTC ISIN record or available in the FIRDS Reference Data and the ISIN itself is traded on a trading venue.

Where an underlying instrument ISIN is not provided as part of the DSB OTC ISIN record or the underlying instrument ISIN is not available in the FIRDS Reference Data, the DSB will set the uToTV status as NULL to enable users to make their determination via other means. Where an underlying ISIN is provided, but was not itself traded on a trading venue, the DSB will set the uToTV status to False.

As the DSB does not have access to publicly available constituent data it is unable to undertake a constituent level uToTV review for index or basket instruments. Subject to industry demand in 2018, the DSB will investigate alternate data sources it could use to define a process to identify all indices that have at least one constituent that is ToTV in order to provide a broader range of uToTV indicators.

1.5.2 Single Name Credit Default Swaps with a LEI underlying

The DSB Product Committee has received regulatory direction that the only acceptable identifiers for CDS underlying instruments are ISINs or LEIs and that ESMA's expectation is that Trading Venues must ensure that all instruments admitted to trading or traded on their venue have an ISIN or LEI.

Consequently, the current product definition for Single Name CDS permits either an ISIN or an LEI as the underlying identifier.

In-line with regulatory direction, the DSB will execute the following:

- set the uToTV status to 'True' where an ISIN is provided as the underlying identifier AND it is reported to FIRDs by at least one trading venue
- set the uTOTV status to 'False' where an ISIN is provided as the underlying identifier AND it is reported to FIRDs by SI's only
- set the uToTV status to 'False' where an LEI is provided as the underlying identifier

1.6 Questions for Industry

The DSB seeks industry feedback on following key aspects:

1.6.1 Timing for provision of ToTV/MiFID II data

- The DSB will use FIRDS Reference Data files to set the ToTV/uToTV indicators and FIRDS Transparency files to determine Thresholds and Liquidity.
- The DSB will send to FIX subscribers the ToTV records that have changed during the day, once a day after all FIRDS files that were published before 9:00AM CET were processed.
- If a user requests a ToTV record before the DSB completes processing all FIRDS files, the DSB could either provide the resulting record that contains a 'current snapshot' (the data that was processed until the request time) or 'yesterday's' data when the last ToTV process was fully completed or not provide the ToTV record and indicate to request again later
- **Subject to industry feedback to the contrary, the DSB proposes to provide the 'current snapshot' (the snapshot is accurate at the time of the request) and indicate that today's ToTV records are still being processed:**
  There will be two attributes in the header of the ToTV record (see section 8.1):
  - The last date when the instrument was updated (LastModifiedDate)
  - The last date when all FIRDS (and DSB) updates were processed (LastCompletedProcessingDate)

LastModifiedDate greater than LastCompletedProcessingDate will indicate that today's ToTV records are still being processed. The DSB will develop a message to FIX/REST API users to notify that the ToTV processing has been completed (Details will follow in the next update to the FIX/REST API documentation) and will make LastCompletedProcessingDate available on the GUI.

Worked example: a user queries an ISIN on 20/09/2017 @ 08:49:

	LastModifiedDate of ISIN "A"	LastCompletedProcessingDate	
User requests ToTV data for ISIN "A" at 20/09/2017 08:49	16/07/2017	19/09/2017	User receives ToTV record for ISIN "A" with a modified date in the past: 16/07/2017
The DSB finishes processing of all FIRDS files and sends an update to subscribers at 20/09/2017 10:02	20/09/2017	20/09/2017	• FIX subscribers receive ToTV data • FIX/REST API users receive a message that ToTV data are available for 20/09/2017 (details will follow in the next update to the FIX/REST API documentation) • GUI indicates that ToTV process was completed on 20/09/2017

1.6.2 Providing a complete FIRDS Reference Data record at the MIC level for both OTC and non-OTC ISINs

As requested by industry during the prior ToTV consultation, the DSB will provide ToTV/MiFID II information for non-OTC instruments at the MIC level to enable users to make their own determination.

- The DSB defines non-OTC products as those not issued by the DSB, but received as part of the FIRDS Reference and Transparency files that are processed.
  - Subject to industry feedback to the contrary, the DSB will provide a complete FIRDS Reference Data record for OTC instruments as part of the ToTV file in the same manner as for non-OTC ISINs.
  - For Transparency Data (LIS, SSTI, Liquidity), the DSB will provide non-equity transparency results only on day 1 as equity transparency information is already available from other sources as a result of MiFID I.
- The DSB will use FIRDS Reference Data to set the value of the ToTV/uToTV indicators and their Effective Dates
- FIRDS Reference Data are at the MIC level, i.e. if an ISIN is submitted by different reporting entities, its Reference Data might vary
- Where data from multiple MICs conflicts, the DSB will set the ToTV/uToTV indicators to True if it has been reported by at least one trading venue
- The estimated cost of providing this additional dataset is €80K to build the infrastructure (as a one off-cost) and €120K to run it on an annual basis[2].
- **Subject to industry feedback to the contrary, the DSB proposes to make available a complete Reference Data record from FIRDS for OTC ISINs in the same manner as for non-OTC to give opportunity for the user to validate the FIRDS data and see which market is trading the instrument, date it was admitted to trading /traded on a market**

1.6.3 Providing ToTV/uToTV as NULL until the instrument/underlying is in FIRDS Reference Data.

- The DSB will only provide ToTV/uToTV indicators for instruments that are in FIRDS Reference Data (as defined in 6.2)
- The DSB will only provide transparency data (Liquidity and LIS/SSTI Thresholds) for instruments that are in the FIRDS Transparency files (as defined in 6.3)
- If an ISIN is submitted to FIRDS Transparency Data for the 1st time before it is submitted to FIRDS Reference Data, the DSB can either
  - delay providing its Transparency Data (Thresholds and Liquidity) until the ISIN is in the FIRDS Reference Data and the ToTV/uToTV flags can be derived
  - provide Transparency Data as it becomes available and have ToTV/uToTV flags as NULL
  - provide Transparency Data as it becomes available and have ToTV/uToTV flags as False

[2] Start-up costs are related to the build and UAT periods, are incurred in a staggered manner, require lower levels of resiliency, support and infrastructure vs. production; whilst run costs are incurred over a 12-month period based on 24*6 availability, resilient infrastructure, production support and higher data consumption levels.

- **Subject to the industry feedback to the contrary, the DSB proposes to set the ToTV/uToTV flags to NULL for any ISINs/Underlying ISINs that are not present in FIRDS Reference Data, and only present in the FIRDS Transparency Data**

1.6.4 Key DSB assumptions (section 6)

- **Industry is requested to highlight any information they are aware of that contradicts the assumptions underpinning the DSB's ToTV/ uToTV service.**

1.6.5 The ToTV JSON record structure (section 8.1)

- **Industry is asked to review the proposed JSON record structure and highlight concerns - with specific suggestions for improvement such that the DSB can consider and rapidly incorporate into the next version of the functional documentation.**

2 Scope

2.1 Instrument Scope

Following Industry feedback, the DSB MiFID II Dataset service will be available for the full scope of instruments submitted to ESMA under MiFID II Article 27 / RTS 23 obligations to allow trading venues and systematic internalizers to submit reference data.

The DSB MiFID II Dataset service will be available for:

- all products for which the DSB issues ISINs. This is currently defined using a combination of CFI Code (ISO 10962: 2015) Letter #2: Group (R-Rates, E-Equity, C-Credit, F-Foreign Exchange and T-Commodities) and CFI Code Letter #1: Category (H-Non-listed and complex options; S-Swaps and F-Forwards).
- non-OTC ISINs. The DSB defines non-OTC products as those not issued by the DSB, but received as part of the FIRDS Reference/Transparency Data files.
    - Subject to industry feedback to the proposal in section 1.6.2 above, the DSB will provide a complete FIRDS Reference Data record for non-OTC instruments as part of the ToTV file.
    - This includes but is not limited to Equities, Fixed Income, Listed Derivatives.
    - For Transparency Data (LIS, SSTI, Liquidity), the DSB will provide Non-Equity Transparency results only and will not provide Equity Transparency results for Day 1.

2.2 MiFID II Dataset Scope

2.2.1 FIRDS Reference Data

The DSB will import all data points from the FIRDS Reference Data files as defined in section 2.3.4 of the following document: https://www.esma.europa.eu/sites/default/files/library/2016-1522_firds_reference_data_reporting_instructions.pdf

Once FIRDS goes live, The DSB will consider using the ANNA Service Bureau (ASB) as well as the DSB ISIN data to validate the FIRDS Reference Data attributes. Until then the DSB will make available all data from the FIRDS Reference Data files at the MIC level for both DSB and non-OTC ISINs as part of the ToTV JSON file, see section 8.1

The DSB will not process FIRDS Invalid Records file (INVINS) at Day 1 - see section 6.2. The need for processing this file will be assessed once FIRDS goes live and the data are available.

2.2.2 FIRDS Transparency Data

The DSB will import the following classifications, flags and thresholds from FIRDS Transparency Data on the basis these are available:

Transparency Data Attribute Name	Example Value
Reporting period	1/Jan/2018 - 31/Mar/2018
Liquidity Flag	TRUE
Pre-Trade Large in Scale (LIS) Threshold	300,000
Pre-Trade Size Specific to The Instrument (SSTI)	250,000
Post-Trade Large in Scale (LIS) Threshold	1,500,000
Post-Trade Size Specific to The Instrument (SSTI)	1,250,000

As defined in section 5.6.2.2 of the following document https://www.esma.europa.eu/sites/default/files/library/2016-1521_mifir_transaction_reporting_technical_reporting_instructions.pdf:

- The currency for LIS and SSTI thresholds is EUR.
- LIS and SSTI thresholds for Emission Allowances are expressed in tons of carbon dioxide.

For Transparency Data (LIS, SSTI, Liquidity), the DSB will provide Non-Equity Transparency results only and will not provide Equity Transparency results for Day 1.

2.2.3 DSB Derived Data

The DSB will derive the following key attributes:

Derived Attribute Name	Example Value
Traded on a Trading Venue	TRUE
ToTV Effective Date	2018-02-01
Underlying Traded on a Trading Venue	FALSE
uToTV Effective Date	2018-02-01

Following industry feedback, ToTV Effective Date and uToTV Effective Date will be stored as part of the ToTV record so that users can identify the date on which a trade first became eligible for reporting.

ToTV indicator is set to true if and only if at least one trading venue reported the instrument to FIRDS.

ToTV Effective Date will be the earliest Effective Date of all the ToTV Effective Dates that relevant Trading Venues reported to ESMA for an ISIN.

uToTV indicator is set to if and only if at least one trading venue reported one of the underlying ISINs to FIRDS.

uToTV Effective Date will be the earliest Effective Date of all the underlying ToTV Effective Dates that relevant Trading Venues reported to ESMA for an ISIN.

Note that the DSB will not be able to identify all instruments with underlying index/basket as uToTV as described in 1.5.1.

A new ToTV JSON template will be developed to hold MiFID II Dataset attributes, see8.1. The JSON structure for DSB's ISIN requests and records will remain unaltered. Non-OTC ISINs will be available from the ToTV file only.

3 Key Requirements

3.1 System requirements

Below are the set of key system requirements for the DSB MiFID II Data Service:

#	Requirement	Description	Frequency
1.1	Add MiFID II Dataset	Against each ISIN, the system will hold the relevant MiFID II Dataset. This dataset is defined in section 2.2 and will include the ToTV and uToTV flags.	Ongoing
1.2	No ISIN Change	When the values or the list of attributes included in the MiFID II Dataset change, the system will not consider this a change or update to the ISIN definition, i.e. ToTV/MiFID II information will be kept in a separate JSON record.	Ongoing
1.3	Update ToTV Flag	For each ISIN, the system will update the ToTV flag. Note, this frequency will be equal to the rate at which FIRDS is updated.	Daily (=FIRDS Reference Data frequency)
1.4	Update uToTV Flag	For each ISIN, the system will update the uToTV flag	Daily (=FIRDS Reference Data frequency)
1.5	Update Transparency Data	For each ISIN, the system will update LIS/SSTI thresholds and Liquidity	Daily (=FIRDS Transparency Data frequency)
1.6	Instrument Expiry Update	The DSB will mark all OTC derivatives with Expiry Date < Today as having ISIN Status = Expired. The ToTV/uToTV flags will be left intact so that the users could retrieve the last ToTV status before the instrument expired. This is to be confirmed with the PC	Daily

3.2 User requirements

Below are the set of key user requirements for the DSB MiFID II Data Service:

#	Requirement	Description	Frequency
2.1	MiFID II Dataset Access	The MiFID II Dataset will be available via all the existing connectivity methods to the DSB: • GUI • File Download • ReST API • FIX API	Ongoing
2.2	Search by MiFID II Dataset	The MiFID II Dataset, including data for non-OTC ISINs, will be fully searchable. Details will follow in the Search guide revised with ToTV changes.	Ad-hoc
2.3	Updates on ToTV data to real-time FIX subscribers	FIX users subscribing to real-time updates from the DSB will receive the ToTV record if any of the MiFID II Dataset attributes change.	Ongoing

4 ToTV/uToTV Proposed Solution

The DSB evaluated industry feedback on various alternative solutions before arriving at the proposal detailed below.

This section provides the definitions for each of the DSB derived attributes within the MiFID II Dataset.

4.1 DSB's ToTV Flag

- If the instrument is in the FIRDS file and the MIC identifies an approved European trading venue, then the ToTV Flag will be set to True
- Approved European trading venues include EU regulated markets, Multilateral Trading Facilities (MTF) and Organised Trading Facilities (OTF).

4.2 ToTV Effective Date

- The ToTV effective date will be the earliest date among all the ToTV Effective Dates that Trading Venues reported to ESMA for a particular ISIN.
- The DSB will use the FIRDS "Date of Admission to Trading or Date of First Trade" attribute[3] to derive the ToTV effective date.

4.3 DSB's uToTV Flag

- DSB's uToTV flag will only be set for instruments with one or more Underlying ISIN
- If the instrument has a single underlier and that underlying instrument is ToTV (as defined in section 4.1) then the instrument is uToTV
- If the instrument has multiple underliers and any of the underlying instruments is ToTV (as defined in section 4.1) then the instrument is uToTV
- Underlying reference data: For calculation of the uToTV flag, if the instruments' ISIN was issued by the DSB, the DSB will use the ISIN record underlying's ISINs. Otherwise, the DSB will use the FIRDS records underlying's ISINs. At a future date, it will be considered using the ANNA Service Bureau (ASB) data to calculate the uToTV flag for instruments having an ISIN non-issued by the DSB.
- Note that the DSB will not be able to identify all instruments with underlying index/basket as uToTV as described in 1.5.1.

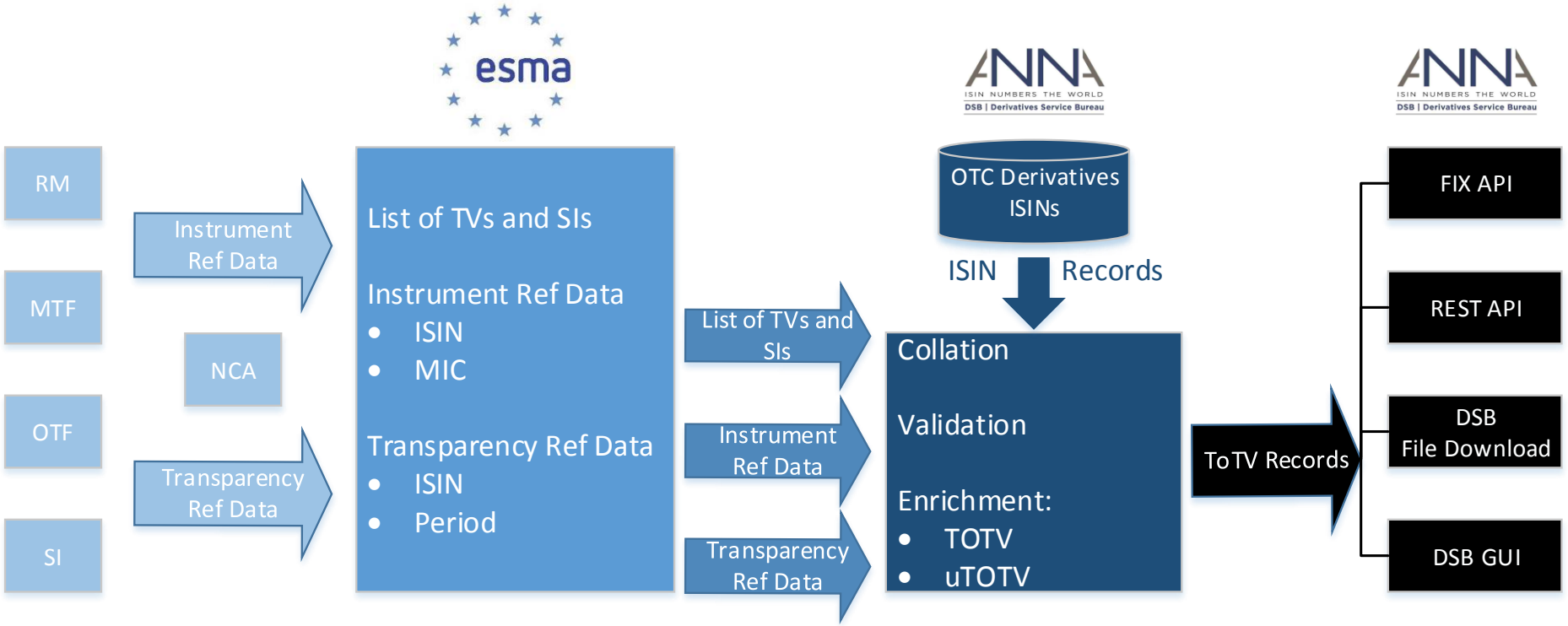
4.4 uToTV Effective Date

- The uToTV effective date will be the earliest Effective Date among all the underlying ToTV Effective Dates that Trading Venues reported to ESMA for a particular ISIN.

[3] As defined in section 2.3.4.2.11 https://www.esma.europa.eu/sites/default/files/library/2016-1522_firds_reference_data_reporting_instructions.pdf

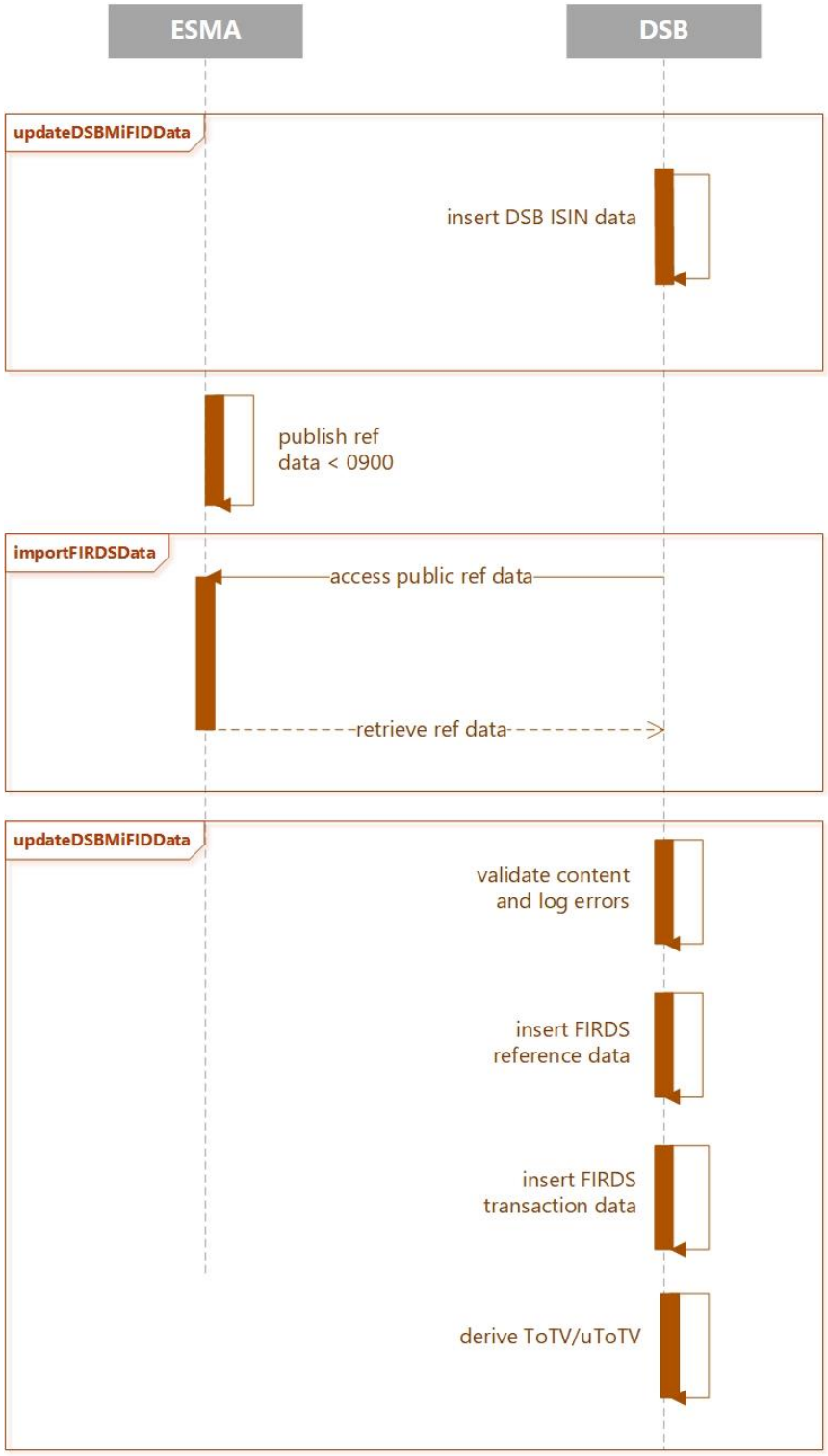
5 System Workflows

5.1 System Diagram



5.2 High-Level Create MiFID II Dataset

The below workflow presents the steps the DSB will follow to create the MiFID II Dataset.

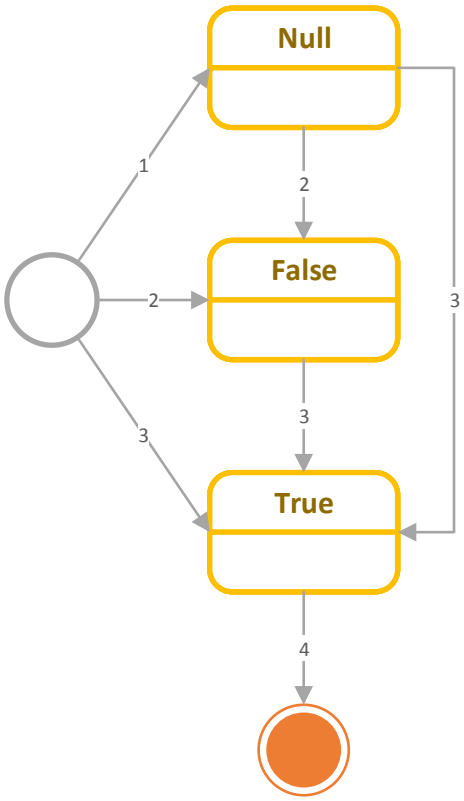


Step	Description
Insert DSB ISIN data	Daily, as an overnight process, the system copies across DSB ISIN Reference Data to MiFID II database to be collated with ESMA Reference/Transparency information once ESMA data are loaded
Access public reference data	**Assumptions** • ESMA enables systematic retrieval of public reference data • FIRDS public data contains a mixture of data from European Trading Venues and Systematic Internalisers • ESMA publishes and maintains RTS 2 Thresholds and liquidity flag • ESMA publishes and maintains a set of approved MIC codes for European Trading Venues and Systematic Internalizers • ESMA publishes a delta of new instruments or changes in instrument reference data each day **Description** Daily, the system accesses ESMA's instrument reference data service. This must be executed as soon as ESMA publish their new set of data (<= 0900) **Constraints** The DSB will not provide MiFID II data for ISINs that are not in FIRDS
Retrieve reference data	**Assumptions** • FIRDS Reference Data are retrieved for ISIN, MIC and Reporting Date • FIRDS Transparency Data are retrieved for ISIN and Reporting Period **Description** The system imports the instrument reference data and updates the DSB cache of ESMA data.
Validate content and log errors	DSB validates integrity and structure of the FIRDS Reference and Transparency files and logs any errors.
Insert FIRDS Reference Data	Insert reference data from FIRDS Reference Data full/delta files
Insert FIRDS Transaction Data	Insert transaction data from FIRDS Non-Equity Transparency results

Step	Description
Derive ToTV/uToTV indicator values	Derive ToTV/uToTV flags and their effective dates **Assumptions** • DSB will have access to an up-to-date list of MICs for approved trading venues in the EU. The DSB will source the list from ESMA prior to running the FIRDS daily update. **Description** • If an instrument has been reported by at least one European trading venue, set the ToTV flag to TRUE in the DSB MiFID II Dataset. • For any instrument with an underlying ISIN, if at least one underlying is ToTV, the instrument will be marked as uToTV. • Note that the DSB will not be able to identify all instruments with underlying index/basket as uToTV as described in 1.5.1 • ToTV Effective Date will be set to the earliest Effective Date of all the ToTV Effective Dates that relevant Trading Venues reported to ESMA for a particular ISIN. • uToTV Effective Date will be set to the earliest Effective Date of all the underlying ToTV Effective Dates that relevant Trading Venues reported to ESMA for a particular ISIN.
Update DSB MiFID II Dataset with other ESMA specific data	**Assumptions** MiFID II Dataset attributes are in FIRDS as stated in the Attribute Scope section. **Description** Update the DSB MiFID II Dataset with all new values for the attributes stated in the Attribute Scope section.

5.3 State transitions ToTV/uToTV

A newly created DSB OTC ISIN will not have ToTV/MiFID II data until the following day's FIRDS data is received.



1. Daily Update from FIRDS:
   - ISIN/Underlying ISIN in FIRDS Transparency Data only (no MIC information available)
   - In addition, uToTV for Instruments with one or more underlying indices: if there is no ISIN for the index/basket in FIRDS Reference Data, uToTV will be set to False

2. Daily Update from FIRDS:
   - ISIN/Underlying ISIN is in FIRDS Reference Data but have been reported by SI's only.

3. Daily Update from FIRDS:
   - ISIN/Underlying ISIN is the FIRDS Reference Data and it is reported by at least one Trading Venue.

4. Instruments marked ToTV/uToTV, remain flagged ToTV/uToTV

6 Key Constraints

6.1 Access to updated European MIC / SI list

The DSB expects to have access to up-to-date list of European trading venues and the associate types (MTF, OTF, RM) and SI's prior to running the daily update from FIRDS. The DSB will use this data to derive ToTV/uToTV flags.

6.2 FIRDS Reference Files

The following files are expected to be available in the public folder on ESMA website and contain up-to-date instruments as they are listed in the ESMA database:

File	**File type**	**ISO 20022 message**	**Naming convention <Sender>_<FileType>_<Recipient>_<Key1>-<Key2>_<Year>.xml**
Full file	FULINS	auth.017.001.01	FIRDS_FULINS_PUBLI_01Z02-000123_18.xml
Delta file	DLTINS	auth.036.001.01	FIRDS_DLTINS_PUBLI_01Z01-000123_18.xml
Invalid records file	INVINS	auth.042.001.01	FIRDS_INVINS_PUBLI_00001-000000_18.xml

It is expected that:

- The FIRDS Reference Data files will be available by 9:00 CET each calendar day and uploaded to the public folder once a day.
- The files will remain in the public folder for 10 days.
- The files will be compressed to .zip and for one compressed file to contain one xml file.
- All data could be in one file or split by multiple files.

It is assumed that:

- FIRDS Reference Data record is unique per ISIN and MIC for the reporting day.

6.3 FIRDS Transparency Files

The following transparency files are expected to be available to download from FIRDS:

File	File type	ISO 20022 message
Non-Equity Transparency Results	DATNCR	auth.045.001.01

The DSB requires information on download interface for FIRDS Transparency files, including file naming convention and connectivity protocol.

It is assumed that:

- ESMA provides access to the DARNCR files daily.
- FIRDS Transparency Data record is unique per ISIN for Reporting period.

6.4 FIRDS sample data format assumptions

As part of preparations for production, the DSB is assuming that a FIRDS sample will be made available in Q4 2017 which will allow the DSB to conduct a final analysis, reconfirm the expected dataset and understand if any revisions to the DSB's assumptions and/or data attributes are required.

6.5 uToTV for Instruments where underlying is an Index

The DSB expects ISIN to be provided in FIRDS Reference Data for any index underlying where it exists. The DSB will use Underlying Index ISIN to set uToTV.

6.6 ISIN being part of the ToTV definition

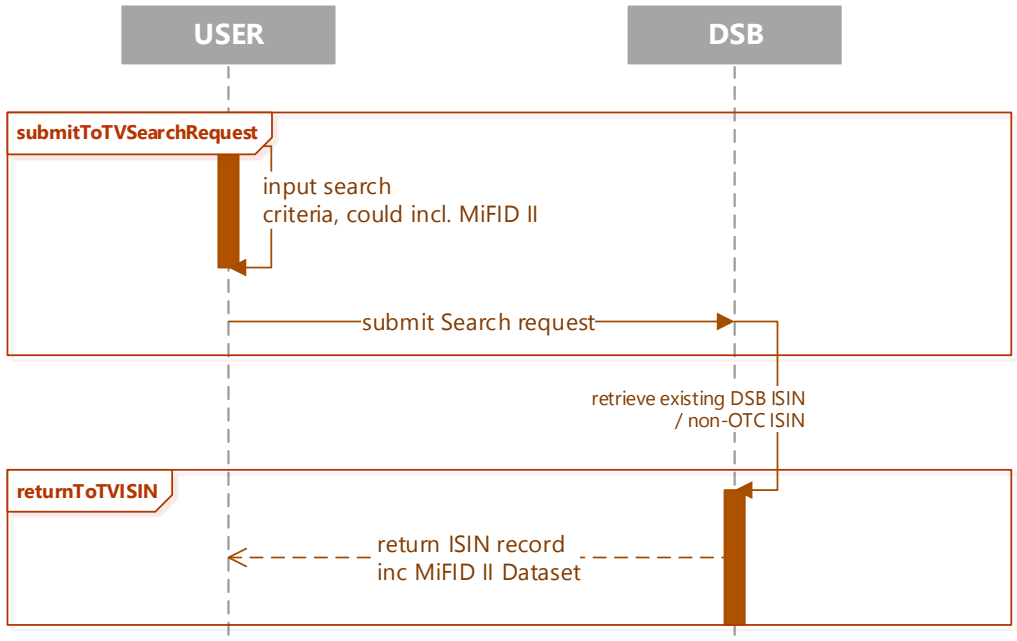
The DSB's proposed model assumes a one to one mapping between ToTV criteria and the ISIN, in light of ESMA's ToTV opinion of May 2017[4]. That is because the ISIN is more granular than all the other reference data fields together and the OTC-ISIN Product Definitions have been carefully designed to guarantee a many-to-one relationship between the OTC-ISIN and the remaining RTS23 reference data fields specified by the ESMA ToTV opinion. Therefore, to optimize the process, the DSB will be using the existence of an ISIN in FIRDS (for a valid MIC) as a proxy for determining the value of the ToTV/uToTV indicators and will not be performing a field by field matching of the other attributes specified in the ESMA opinion. The DSB believes this is appropriate on the basis that the reference data for each ISIN will uniquely map to the relevant RTS23 fields 2-4 and 13-48 and therefore it is sufficient to compare only the ISIN value for the purpose of determining the ToTV flag. Any changes to this approach will need the DSB to revisit its technical architecture and may result in additional development effort and thus impact ToTV/ uToTV launch.

[4] https://www.esma.europa.eu/sites/default/files/library/esma70-156-117_mifir_opinion_on_totv.pdf?lipi=urn%3Ali%3Apage%3Ad_flagship3_pulse_read%3B2UW1B6S9T1S8RPucICSOSg%3D%3D

7 User Workflows

7.1 ToTV Request

The below presents the steps the DSB will follow for a user requesting a ToTV/MiFID II information (via FIX, REST API or GUI)



Step	Description
Submit ToTV Search request	**Assumptions** • User submits syntactically valid search request **Description** The user runs search by attributes that can be a mixture of MiFID II attributes and core ISIN attributes or the ISIN Details will follow in a revised Search guide – on Github on 30 Oct 17.
Retrieve existing ISIN and MiFID data	**Description** The user submits search attributes and the DSB searches through the existing MiFID II records and retrieves any ISIN record where there is a match. Every ISIN record is returned with the MiFID II data points alongside it. If no ISIN records meet search conditions, "Zero results" message is returned.

8 Technical Detail

This section includes the technical implementation detail of the MiFID II Data Service as required by the DSB User base.

8.1 JSON for MiFID II data

All MiFID II data will be provided in a JSON format valid to the ToTV.V1 JSON schema which will be made available on ANNA-DSB GitHub. The updated ToTV timelines will be communicated as part of this document release.

The general structure of a record contains:

Name	Datatype Type	Required	Multiple	Notes
Header	Component	✓	×	
-| ISIN	ISIN	✓	×	String
-| LastModifiedDate	Date	✓	×	Format: YYYY-MM-DD
-| LastCompletedProcessingDate	Date	✓	×	Format: YYYY-MM-DD
-| AssetClass	Enumerated string	✓	×	Enumeration: • Rates • Commodities • Equity • Credit • Foreign Exchange • Other (or unknown) • Loan Lease
-| InstrumentType	Enumerated string	✓	×	Enumeration: • Swaps • Option • Spot • Forward • Strategy • Financing • Future

Name	Datatype Type	Required	Multiple	Notes
ISIN-DSB	Component	×	×	
-| record	JSON	×	×	The entire ISIN record as available in the DSB
FIRDS-RefData	Component	×	×	
-| MICType	MICType	×	✓	Market types are: • RM • MTF • OTF • SI • UNKNOWN
-| -| record	JSON	×	×	The entire FIRDS reference data for the ISIN, MIC and for the last date it has changed in FIRDS
FIRDS-TransparencyData	Component	×	×	
-| Period	String format: "YYYY-MM-DD: YYYY-MM-DD" Or 'default'	×	✓	
-| -| record	JSON	×	×	The entire FIRDS transparency data for the ISIN and period
Derived	Component	✓	×	
-| ToTV	Boolean	✓	×	See section "Derived Data" above.

Name	Datatype Type	Required	Multiple	Notes
	Or null			
-| ToTV-EffectiveDate	Date	×	×	
-| uToTV	Boolean Or null	✓	×	
-| uToTV-EffectiveDate	Date	×	×	

Note: In the above table, -| stands for nesting within the JSON record.

8.2 GUI Access

The DSB will develop a new ToTV search. The ToTV search will run against MiFID II Dataset and will return MiFID II data alongside the ISIN record.

8.3 ReST and FIX Access

Details on ToTV/MiFID II changes to FIX and REST API can be found on GitHub:

- DSB FIX API 3.00 RC1
- DSB REST API 3.00 RC1

Note that changes in the MiFID II Dataset values will trigger an update record to FIX subscribers, with a record updated on completion of the DSB's ToTV/ uToTV process. See in 1.6.1 Questions to Industry.

8.4 File Download

Access to ToTV/uToTV and associated MiFID II Dataset attributes will also be available via the existing file download capability.

Any ISINs that have been created/updated today, will be accessible from File Download the following day. The DSB will change the file download folder structure to introduce a new section for ToTV as follows:

https://uat.anna-dsb.com/file-download/totv/

https://uat.anna-dsb.com/file-download/json_schema/totv-product-definitions

9 Availability

Apart for planned service interruptions, the system will operate 7 days per week and 24 hours per day, receiving and generating reference data every day.

Support will be available during DSB working days and hours. If an incident occurs on a non-working day / outside of DSB working hours, it should be analysed on the next working day and handled per the DSB support processes.

10 Performance

The DSB's best estimate for number of FIRDS daily records is 8 million. The system must be able to support collection, processing and publication of 8 million valid instrument records daily.

11 FAQ

1. What happens if an investment firm requests an ISIN and ToTV is not set as the instrument is not traded on a venue, then a week later a trading venue requests an ISIN for that instrument will the ToTV Flag be set immediately?
    - The DSB's ToTV status will be set to NULL until such time as the OTC derivative ISIN is present on FIRDS Reference Data
    - Once the OTC derivative ISIN is reported in FIRDS with a valid MIC, the DSB will set the instrument's status to ToTV
    - uToTV status will follow the approach set out in section 1.6.3 above

2. If an investment firm requests an ISIN (and it is a brand-new instrument) and provides in the input the underlying's ISIN/LEI will DBS set the uToTV flag immediately?
    - The DSB will only set the uToTV indicator for instruments with Underlying ISIN. If Underlying ISIN has been marked as ToTV (had been previously reported to FIRDS by at least one trading venue), the DSB will not set the uToTV flag immediately at creation. Both ToTV and uToTV flags as well as other MiFID II data will be set in the next processing date.

3. How will DSB determine uToTV for XSNOREFOB underlying products i.e. credit derivatives where an LEI is provided as the underlying instrument rather than an ISIN?
    - Please refer to section 1.5.2 above

4. Has any progress been made on identifying a source to determine whether an Index is uToTV?
    - Please refer to section 1.5.1 above

5. Does the DSB know if there is still a mismatch between ISIN attributes and RTS 23 for Strike Price and Fixed Rate? How will ToTV be determined if Strike Price is not included in the ISIN but is included in RTS 23?
    - As described in 6.6, the DSB is assuming a 1 to 1 mapping for ToTV granularity to ISIN. If ISIN has been reported to FIRDS by at least one European trading venue, it will be marked as ToTV.

12 Appendix

12.1 Sources of Data for ToTV/uToTV Determination

The DSB has considered several options for sourcing the data for ToTV / uToTV determination:

12.1.1 Source 1 – Utilize FIRDS data

Use FIRDS to define ToTV. If the ISIN is present in the FIRDS database and the reporting MIC is an approved Trading Venue then the ISIN is ToTV.

A ToTV service can use a combination of FIRDS, using the MIC and the ISIN, with the DSB ISIN Database (because ISIN granularity is greater than the RTS 23 product attributes) to identify which products are considered ToTV and uToTV.

12.1.1.1 Challenges

1. FIRDS is only available T+1. Depending on how Trading Venues approach reference data reporting, there is the possibility that some instruments will not be transparent on the day of their greatest liquidity due to the inclusion of the expiry date within the product definition.
2. Trades or quotes that occur on a trading venue after 1800 on T do not need to be reported as reference data which means, potentially, there will be products that are ToTV but will not be treated as such until T+2.
3. ESMA has stated that FIRDS should not be used as the Golden Source of data, therefore relying exclusively on this source may cause regulatory concern

12.1.2 Source 2 – Utilize Post-trade disclosure data

Collate APA and trading venues published post-trade data and combine the information in real-time to drive ToTV for all DSB OTC ISINs.

ToTV can use a combination of APA data, using the MIC and the ISIN (where available) with the DSB ISIN Database to identify which products are ToTV and uToTV.

12.1.2.1 Challenges

1. Some APA post-trade disclosure data will have the ISIN plus some transactional data. However, some APA post-trade disclosure data will not have the ISIN. Indeed, there's no requirement for them to publish sufficient data to create an ISIN. Given that ToTV is defined including the ISIN, this means that the set of data published by an APA without an ISIN cannot be assessed as being ToTV or not.
2. Some transactions submitted for post-trade disclosure will be subject to deferrals – some of these deferrals can extend to T+2; any collection of post-trade disclosure data 'real-time' will not necessarily contain these products.
3. APA pre-trade transparency data has no requirement to use the ISIN or, in fact, publish any detailed product attributes for a quote. Again, since the ISIN is included in the ToTV discussion, any pre-trade data that does not already voluntarily have the ISIN is unlikely to be useful in determining ToTV.
4. There is no requirement for an SI or a Trading Venue to use an APA for pre-trade transparency. Collection of pre-trade data from the APAs will be incomplete and therefore will not provide the full set of ToTV products in real-time.

12.1.3 Source 3 – Utilize ISIN Creation Data

The DSB could look at amending the ISIN request interaction by adding a flag for all users to indicate whether the ISIN will be 'available to trade' on a trading venue.

This would capture all new instruments in real-time for ToTV.

12.1.3.1 Challenges

1. Requires a change in the DSB technical implementation and those of the entire industry
2. Investment Firms might consider revealing that intention as a breach of confidentiality and that might put their own trading strategies at risk.
3. There would have to be a reconciliation at the end of the day to ensure ISINs declared as ToTV by an investment firm had, in fact, also been requested and marked by a trading venue.

12.2 Asset Class ToTV Attributes

Below are the sets of attributes for each asset class that ESMA opinion defines as Traded on a Trading Venue (section 6.6).

12.2.1 Rates

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying instrument ISIN	26
Option Type	30
Option Exercise Style	33
Delivery type	34
ISO Reference Rate	40
Reference Rate Term Unit	41
Reference Rate Term Value	41
ISO Other Leg Reference Rate	45
Other Leg Reference Rate Term Unit	46
Other Leg Reference Rate Term Value	46

12.2.2 Credit

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying instrument ISIN	26
Underlying instrument LEI	27
ISO Underlying Instrument Index	28
Underlying Instrument Index Term Unit	29
Underlying Instrument Index Term Value	29
Option Type	30
Option Exercise Style	33
Delivery type	34

12.2.3 Foreign Exchange

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Option Type	30
Option Exercise Style	33
Delivery type	34
Other Notional Currency	47
FX Type	48

12.2.4 Equities

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying instrument ISIN	26
ISO Underlying Instrument Index	28
Option Type	30
Strike Price	31
Option Exercise Style	33
Delivery type	34

12.2.5 Commodities

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying Instrument ISIN	26
Underlying Instrument Index	28

Option Type	30
Option Exercise Style	33
Delivery type	34
Base Product	35
Sub Product	36
Additional Sub Product	37
Transaction Type	38
Final Price type	39