



European Securities and  
Markets Authority

# EMIR and SFTR data quality report 2020



15 April 2021

ESMA80-193-1713



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# Executive summary

The European Securities and Markets Authority (ESMA) is publishing for the first time "Data Quality Report" to highlight its supervisory and supervisory convergence activities regarding the quality of data reported to Trade Repositories (TRs) under the European Market Infrastructure Regulation (EMIR) and under the Securities Financing Transactions Regulation (SFTR). This report aims to provide an overview of the state of play under the two reporting regimes, while also providing insights to national competent authorities (NCAs') and ESMA's ongoing efforts to improve the quality of the data.

## Data Quality Action Plan and Data Quality Assessment Framework

EMIR and SFTR establish a supervisory framework with complementary supervisory responsibilities (i.e. NCAs supervise the reporting counterparties and ESMA supervises the TRs). The joint efforts by NCAs and ESMA to improve the quality of EMIR and SFTR data are embedded in various frameworks. This section outlines key frameworks (Data Quality Action Plan and Data Quality Assessment Framework) and processes (Data Quality Review and EMIR and SFTR data quality log) established at the European level to monitor data quality on an ongoing basis and to ensure adequate supervisory engagement with the supervised entities, namely TRs and reporting counterparties.

Based on the positive results obtained in the most recent Data Quality Review, this report also emphasises the need for an increased supervisory focus on key data reporting aspects where improvement is still needed.

ESMA also underlines the need for increased cooperation with data users to further enhance the detection and remediation of data quality issues based on feedback from users.

## Recent developments across EMIR and SFTR reporting regimes

Brexit had a profound impact on the structure of the EU TR market. One TR decided not to establish an EU subsidiary and two TRs from the same group decided to cease their regulatory reporting business while another two chose to establish subsidiaries in the EU to be able to provide services to EU counterparties. The EU landscape now consists of four TRs providing services under both EMIR and SFTR. The reporting obligation under SFTR started effectively in July 2020. Data reporting volumes under EMIR and SFTR declined approximately 50% from December 2020 to January 2021 as UK counterparties no longer have a reporting obligation in the EU.

Despite the challenges posed by porting of data from TRs exiting the Union and Brexit itself, counterparties and TRs managed to adapt to the situation and perform all necessary changes to avoid any significant negative impact. Indeed, ESMA did not observe any disruptive changes that would undermine usability of the data.

## EMIR reporting trends and data quality metrics

The onset of the COVID-19 pandemic and Brexit have remarkably impacted EMIR reporting trends through the emergence of increased market volatility and volume shifts. ESMA monitors and assesses data quality of regulatory reports provided by TRs using a wide variety of tools that consider the various dimensions of data quality, such as completeness, timeliness, availability, adherence to format, and content, and reconciliation.

For example, the following trends were observed: a steady level of daily submissions being reported late by reporting counterparties; a high percentage of non-reported derivatives persists; and rejection rates have slightly increased since Brexit.

The reconciliation rate of derivatives has improved over the last years, however it is still at an unsatisfactory level and therefore additional effort are needed by counterparties and TRs. ESMA identifies key data fields where the main reporting problems reside with an objective to better assess the appropriate ways for their remediation.

While significant efforts have been made by all stakeholders (counterparties, TRs, ESMA and NCAs), data quality issues continue to persist in key data quality domains as presented in this report. While ESMA and the other authorities have already been making a wide use of TR data for the purposes of assessing financial and economic risks, further effort is needed to improve data quality. This periodic report aims to provide transparency around key initiatives to achieve this objective and to track progress.

### **SFTR reporting trends and data quality metrics**

Following the entry into force of the reporting obligation under SFTR, ESMA has begun and will continue to assess data quality using the same framework it uses for EMIR. Due to the relatively short time since the reporting go-live date, the report mainly focuses on providing initial overview of the data reporting landscape and TR rejection rates of counterparty submissions. While the TR rejection rate has been elevated in the initial weeks of reporting, it declined significantly since then indicating that TRs and counterparties have settled into the new reporting regime.

Considering the complexity and large scale of the SFTR reporting regime, it is imperative that counterparties, TRs, ESMA and NCAs dedicate enough resources to monitor data quality thoroughly.

Future editions of this report will include more extensive overview of SFTR data quality.

# Introduction

The European Market Infrastructure Regulation (EMIR) and Securities Financing Transactions Regulation (SFTR) establish requirements for counterparties to report details of derivatives and securities financing transactions to Trade Repositories (TRs), respectively. TRs, in turn, make the data available to various European authorities and central banks depending on their mandate.

The European Securities and Markets Authority (ESMA) has several roles and responsibilities under EMIR and SFTR. Firstly, ESMA actively uses EMIR and SFTR data to monitor financial stability risks<sup>1</sup>. Furthermore, ESMA is responsible for the development of EMIR and SFTR reporting rules and for the supervision of TRs. National Competent Authorities (NCAs) have supervisory responsibilities over the reporting obligation of counterparties. Finally, ESMA coordinates supervisory convergence initiatives with the aim of promoting sound, efficient, and consistent supervision of EMIR and SFTR reporting obligation across European Member States.

The main objective for establishing the two reporting regimes was to increase transparency of the derivatives and Securities Financing Transaction (SFT) markets and to improve the ability of European authorities to monitor systemic and financial stability risks. While reporting under SFTR began very recently, EMIR data is being used extensively for such purposes since 2014<sup>2</sup>.

This report aims to provide an overview of the state of data quality under the two reporting regimes, while also providing insights on NCAs' and ESMA's ongoing efforts to improve the quality of the data and, in turn, to support their use for financial market stability and integrity monitoring.

ESMA has been using EMIR and SFTR data to monitor and detect data quality issues since inception. For this purpose, ESMA has developed a dedicated framework (the Data Quality Assessment Framework) and an extensive suite of analytical tools and indicators. Given the complexity of the reported data, e.g. EMIR and SFTR both have more than 100 reportable fields and TRs report to ESMA 10s of millions of records daily<sup>3</sup>, and the importance of the reporting obligation, the supervision of this data requires the use of advanced tools and techniques to adequately process and analyse such data.

This report presents, for the first time, an overview of selected data quality metrics used by ESMA to assess the data quality of regulatory reporting and the subsequent report generation by TRs. While this first edition only provides a restricted number of data quality metrics, the scope will be enlarged in future editions.

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1 See for example ESMA's Trends, Risks and Vulnerabilities Report at <https://www.esma.europa.eu/market-analysis/financial-stability>

2 See for example ESMA's derivatives markets Annual Statistical Report at <https://www.esma.europa.eu/market-analysis/financial-stability>

3 Daily derivatives life-cycle submissions as well as latest states of open derivatives

# Data Quality Action Plan and Data Quality Assessment Framework

The following section describes the efforts by ESMA and NCAs to improve the quality of EMIR and SFTR data. In particular, the section outlines key frameworks (Data Quality Action Plan and Data Quality Assessment Framework) and processes (Data Quality Review and EMIR and SFTR data quality log) established at the European level to monitor data quality on an ongoing basis and to ensure adequate supervisory engagement for both reporting counterparties and TRs.

## Data Quality Action Plan

The Data Quality Action Plan (DQAP) is a major project that NCAs and ESMA jointly launched in September 2014. It aims at improving the quality and usability of data that is reported by counterparties and made available by the TRs.

The DQAP encompasses activities related to the policy work, NCAs' supervision of the reporting counterparties and ESMA's supervision of the TRs, to address the potential issues in all areas that are key for the quality of the final data, notably: (i) the comprehensive, detailed, and precise specification of the reporting requirements; (ii) the complete and correct reporting by the counterparties to the TRs; and (iii) the provision of complete and accurate data by the TRs to the authorities.

## Data Quality Review

In particular, the DQAP envisages that, on a sample basis, NCAs perform a quantitative assessment of the quality of data reported by counterparties in their Member State and follow up with the relevant entities on the identified issues. This exercise, currently performed annually, is called Data Quality Review (DQR).

As highlighted by the findings of the EMIR Peer Review<sup>4</sup>, the DQR is a useful data-driven supervisory tool, that enables the NCAs to compare the specific data quality indicators computed for their supervised entities with the ones of the counterparties based in other Member States. Furthermore, it allows to identify

cross-border issues which may point to a need for a more comprehensive common guidance.

Each year ESMA and NCAs agree jointly on the DQR methodology. The methodology establishes a harmonised approach to selecting samples of counterparties, defining common specifications of the data quality tests to be performed, as well as specifying details of the information NCAs should provide to ESMA with regards to the results of the DQR and follow-up supervisory actions. Based on this information, ESMA prepares an annual update report to the Board of Supervisors.

**Scope of the Data Quality Review:** In 2020, NCAs undertook over 30 data quality tests grouped into three areas: (i) analysis of pairing and matching of the reports – for the counterparties with the highest number of unpaired outstanding trades; (ii) analysis of completeness, accuracy, timeliness, and rejections of reports made by significant reporting entities – for the counterparties with the highest number of outstanding derivatives; and (iii) thematic review: analysis of reporting of valuation and collateral data – for the financial counterparty (FC), central clearing counterparties (CCPs), or non-financial counterparties above the clearing threshold (NFC+) with the highest number of outstanding trades with a blank or a zero for the EMIR field "Value of the contract".

For each area, NCAs were required to select a sample of at least five counterparties with the worst performance in the testing period, conduct

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<sup>4</sup> [https://www.esma.europa.eu/sites/default/files/library/esma42-111-4895\\_emir\\_data\\_quality\\_peer\\_review.pdf](https://www.esma.europa.eu/sites/default/files/library/esma42-111-4895_emir_data_quality_peer_review.pdf)

all the relevant tests for the chosen entities and follow up with them on the findings.

The 'thematic review', introduced for the first time in 2019, consists of a series of tests dedicated to a specific topic concerning the most material reporting problems and conducted for a sample of entities selected only for that specific review. This approach follows the principle of risk-based data-driven supervision and supervisory convergence and makes the thematic review a very powerful tool, ensuring that the supervisory efforts are directed to resolving the actual problems. The subject for the thematic review is chosen jointly by NCAs and ESMA based on the analysis of the complete EMIR dataset at EU level and the discussion on supervisory priorities.

Following this approach, NCAs and ESMA decided to focus the thematic review on reporting of valuations and margins, both in 2019 and 2020, given the still unsatisfactory quality of reporting for these key fields that are crucial for the monitoring of systemic risks. This review targeted the counterparties with the highest number of outstanding derivatives for which the valuation of the contract was not provided. Its main purpose was to assess, through several dedicated tests, the completeness, timeliness, and accuracy of valuation and margin data. However, since valuation and margin data need to be provided daily, lack of this information often points to broader reporting problems, such as under-reporting or failure to duly terminate the derivatives that in fact are no longer outstanding.

**DQR 2020 results:** The results of the quantitative analysis of the data quality tests performed by the NCAs illustrate improvements in some of the analysed areas, while other data quality issues, such as reconciliation problems or failures to duly terminate trades, continue to persist. In 2020 ESMA additionally analysed the evolution of data quality at the level of individual entities based on the small sample of counterparties selected in the 2019 thematic review and the specific data quality test related to the completeness of the EMIR field 'Value of contract'. It has been observed that approximately 65% of the counterparties approached by the NCAs in the previous year in the context of the thematic review have improved their reporting of the EMIR

field 'Value of contract'. While this analysis was performed for a small subset of entities and was limited to a single data quality test, it shows the effectiveness of this type of test and subsequent follow-up. Having in mind the important scale of this aspect (see section on "Non-reporting of valuations by counterparties") stronger supervisory pressure and closer monitoring of the implementation of remedial actions is needed. The steady improvement of the reporting practices by the supervised entities will continue being one of the aspects of data quality supervision that NCAs and ESMA plan to act on.

NCAs and ESMA will continue their supervisory efforts under the DQAP project in 2021, focusing on those areas where deficiencies have been identified so far.

**ESMA and NCA work on SFTR data quality:** SFTR reporting regime has started in July 2020 and ESMA and NCAs are working on the implementation of data quality checks and reviews. For 2021, ESMA and NCAs have agreed to carry out two rounds of data quality reviews (like the DQR under EMIR). The focus will be on format and content reporting, timeliness of reporting and reconciliation of reported data by TRs.

In its annual work programme, ESMA has also published its priorities of TRs under SFTR<sup>5</sup>. In particular, ESMA will focus on verifying the correctness of implementation of the SFTR validation rules by TRs, assessing completeness and accuracy of SFTR regulatory reports and monitoring TR reconciliation processes.

## Cooperation with data users

Besides the DQAP and DQR, ESMA has established several other initiatives that aim at improving the quality and usability of the data reported by reporting counterparties and TRs.

**Data Quality Log:** To ensure that feedback from EMIR and SFTR data users is taken into account in the supervisory prioritisation process, ESMA set up a framework to collect data quality issues observed by data users and to organise supervisory follow up either directly with TRs or, in case of counterparty reporting issues, to pass the information on to the relevant NCA.

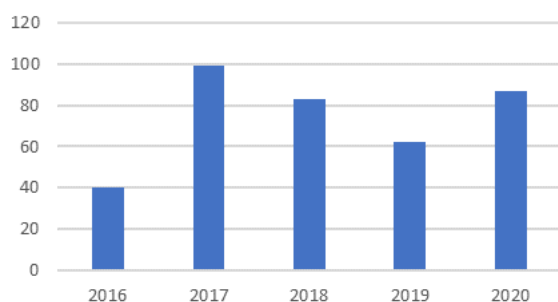
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<sup>5</sup> See

[https://www.esma.europa.eu/sites/default/files/library/esma20-95-1273\\_2021\\_annual\\_work\\_programme.pdf](https://www.esma.europa.eu/sites/default/files/library/esma20-95-1273_2021_annual_work_programme.pdf)



Chart 1  
ESMA data quality log of issues  
**ESMA has been actively collecting feedback from EMIR and SFTR data users**



Note: Number of reported issues.  
Source: ESMA

EMIR data quality issues have been reported since 2016. 87 issues were reported during 2020. Reported issues include, among others, abnormal/irregular values caused by counterparties misreporting, access to current and historical TR regulatory reports, different kinds of TR related issues, and problems with data reconciliation.

**Abnormal values:** Starting mid-2020, ESMA has introduced a new process to regularly share information with NCAs on identified abnormal values reported by counterparties. The objective is to support NCAs in their own supervisory activities by detecting irregularities in the data counterparties submitted to TRs. ESMA's focus has been on the identification of such irregular values across a range of EMIR fields, where strict TR validation rules could not be easily established, such as mark-to-market valuations, contract notionals, collateral and margin reporting<sup>6</sup>. ESMA established exchanges of information on potential abnormal values with NCAs on a monthly basis.

While, by their very nature, abnormal values do not represent a significant proportion of the total number of open derivatives, their presence can introduce significant biases to any economic/financial risk analysis relying on the data<sup>7</sup>. Therefore, from a supervisory perspective, it is important to perform active identification of such

<sup>6</sup> ESMA uses various internal methodologies to identify and treat abnormal values. For example, for the purposes of economic analysis, ESMA is using a statistical approach (identifying outliers in notional values) elaborated in detail here: [https://www.esma.europa.eu/system/files\\_force/library/esma\\_50-165-639\\_esma-rae\\_asr-derivatives\\_2018.pdf?download=1](https://www.esma.europa.eu/system/files_force/library/esma_50-165-639_esma-rae_asr-derivatives_2018.pdf?download=1)

While the results of the above mentioned statistical approach is also considered for the purposes of the dissemination of the information to NCAs, ESMA has developed an approach

abnormal values and share them with the responsible NCA.

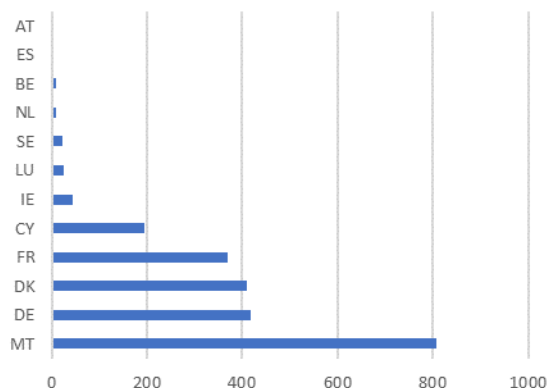
From August to December 2020, ESMA notified NCA on 25 occasions of a total of 2309 potential abnormal values across twelve different Member States. ESMA received feedback from NCAs in 13 cases. As a result of the follow-up actions by NCAs, several of the potential abnormal values that were notified to NCAs were amended by counterparties, while others were confirmed to be valid values. Chart 2 provides an overview of the notified potential abnormal values detected from August to December 2020.

whereby abnormal values are identified across all numerical fields of EMIR using a combination of a statistical approach and an expert evaluation. Expert evaluation is used to confirm results of statistical approach and to verify whether identified abnormal values may or not be in line with current market standards. As regards statistical approaches, ESMA utilizes non-parametric tests (i.e. statistical distributions) as well as machine learning anomaly detection algorithms.

<sup>7</sup> Such as mark-to-market contract valuation with +100 billion EUR.

Chart 2  
Number of potential abnormal values notified by ESMA, per Member State

**ESMA has also been sharing potential data quality issues with NCAs**



Note: ESMA considers potential abnormal values as those that significantly exceed expected values for a given field. ESMA uses a combination of statistical methods and an expert judgement approach to identify such abnormal values.

Source: ESMA

## Data Quality Assessment Framework

As part of the DQAP, ESMA has established a comprehensive framework to monitor data quality of the EMIR and SFTR reporting regimes. The framework identifies control methods, frequencies, and techniques to detect data

quality issues across key data quality aspects such as accuracy, completeness, consistency, timeliness, and uniqueness.

The control methods have been designed to identify data quality issues across all data quality aspects, i.e. completeness, timeliness, consistency, accuracy and uniqueness, and various levels of the data reporting flow, i.e. from report/file level analysis to field/value checks.

ESMA's framework accounts for the fact that data quality issues can be caused by both TRs and counterparties. Where data quality issues are caused by TRs, ESMA engages in supervisory follow-ups directly. Where ESMA identifies counterparty reporting issues, it organises follow-ups using other frameworks such as those described above (e.g. DQAP, data quality log, and abnormal values).

A selection of key DQ indicators and outcomes of the framework are presented in the subsequent sections of the report.

# Recent developments across EMIR and SFTR reporting regimes

The following section presents key developments in 2020 that had an important impact on EMIR and SFTR data reporting flows. In particular, Brexit, the wind-downs of several TRs, and the associated porting of data significantly impacted data reporting.

## Brexit and its impact on EMIR and SFTR reporting

Brexit triggered many changes in the TR market structure: one TR wound down its EU operation as a result of a decision to not continue to provide TR services in the EU post Brexit (ICE TVEL) and two TRs wound down their operations completely due to the commercial decision to not continue to offer their services (NATR and CME ETR). In contrast, DDRL and UnaVista established TRs in the EU, and REGIS-TR<sup>8</sup> established a UK TR; each conducting the necessary data transfers between the EU and the UK entity of the same group.

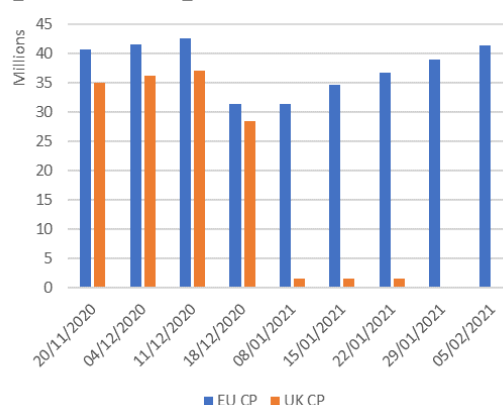
Prior to the Brexit date, UK reporting counterparties had to ensure that their outstanding derivatives were reported to a UK TR, while EU reporting counterparties had to ensure that they reported their outstanding derivatives to an EU-TR. All clients, i.e. reporting counterparties, of the wound-down TRs transferred their outstanding derivative data to other TRs by the means of the existing portability process between TRs<sup>9</sup>.

Through continuous monitoring, consequent follow-ups with involved stakeholders such as NCAs and TRs, and quick resolution of encountered issues, ESMA ensured that the wind-down activities did not lead to any interruptions in the continuity of the provision of regulatory reports to all data users.

**Impact of Brexit on EMIR reporting regime:** The direct impact of Brexit on the volumes reported under EMIR is shown in Chart 3. Prior to Brexit, the number of open contracts reported to TRs by

UK counterparties represented approximately 50% of the total. Post-Brexit, there was a sharp decline in the volumes of open derivatives reported by UK counterparties from 28,5 million on 18 December 2020 to zero on 29 January 2021. This is due to the expectation for TRs to terminate derivatives reported by UK counterparties within 1 month of Brexit<sup>10</sup>.

Chart 3  
EU vs UK counterparty open derivatives by reference date  
**UK counterparties no longer have EMIR reporting obligation following Brexit**



Notes: 'EU CP' are counterparties where the Member State of the reporting counterparty is in the EU. 'UK CP' are counterparties from the UK. The Member State of a reporting counterparty is identified using the GLEIF reference data.

Data for 25/12/2020 and 1/1/2021 is not shown since these two days are TARGET 2 holidays.

Source: Trade Repositories, GLEIF and ESMA calculations

**Impact of Brexit on SFTR reporting regime:** In December 2020, more than 2 million open SFTs (see Chart 4) were reported by branches of UK reporting counterparties, decreasing to approximately 250.000 open SFTs in the beginning of January. This decline was driven by the removal of UK and non-EEA branches of UK counterparties by TRs. EU branches of UK

<sup>8</sup> REGIS-TR did not establish a UK TR for reporting SFTs.

<sup>9</sup> See <https://www.esma.europa.eu/document/guidelines-transfer-data-between-trs>

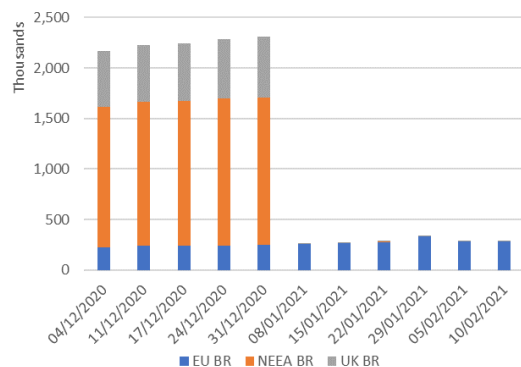
<sup>10</sup> For more details, please see the expectations set out in ESMA's public statement ESMA74-362-88 (dated 10

November 2020) at [https://www.esma.europa.eu/sites/default/files/library/esma74-362-881\\_statement\\_brexit\\_emir\\_and\\_sftr\\_data.pdf](https://www.esma.europa.eu/sites/default/files/library/esma74-362-881_statement_brexit_emir_and_sftr_data.pdf).

counterparties continue to have a reporting obligation in the EU and therefore continue to appear in the SFTR regulatory reports.

Chart 4  
UK reporting counterparties broken down by location of their branch

**UK counterparties no longer have SFTR reporting obligation following Brexit**



Notes: Number of open derivatives of UK reporting counterparties with breakdown by the location of their branches. 'EU BR' stands for EU-27 located branches, 'NEEA BR' stands for non-EEA branches, and 'UK BR' stands for UK branches. The Member State of the reporting counterparty is identified using the GLEIF reference data.

Source: Trade Repositories, GLEIF and ESMA calculations

**Portability<sup>11</sup>**

Portability, the process for transfer of data from one TR to another, was widely used throughout the last quarter of 2020. The majority of porting activities took place at the request of reporting counterparties in the context of CME ETR's wind-down, as well as the porting of the EU data from DDRL to DDRIE and from UnaVista's UK TR to the EU TR. Other reasons for porting were related to Brexit, mandatory delegation of reporting under EMIR REFIT, or voluntary porting.

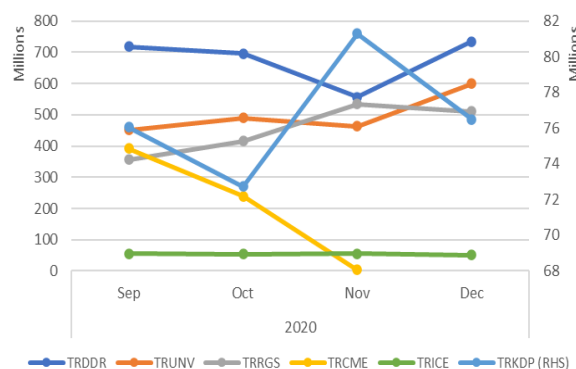
As part of its monitoring activities, ESMA closely engaged with NCAs and TRs, to ensure that counterparties onboarded a new TR in a timely manner. ESMA also informed NCAs of observed cases of porting that was not concluded in line with the requirements set out in the Guidelines.

**CME ETR wind-down:** From about 400 million submissions in September, CME ETR's monthly

volume declined steeply (see Chart 5) representing the porting out of its clients as part of the wind-down activities. By November 2020, the wind-down was completed, with more than 16.000 single LEIs having been ported out to other TRs. As can be seen in Chart 5, the ported derivative trades were absorbed by the other TRs.

**ICE wind-down:** Due to ICE TVEL's decision not to establish an EU EMIR-TR, the EU reporting counterparties needed to port out to an EU EMIR-TR prior to the Brexit date. As UK reporting counterparties represented the vast majority of ICE TVEL's client base prior to Brexit, the decline in reported derivative volumes was rather small. As shown in Chart 5, the volumes of daily submissions per month reported by ICE-TVEL slightly decreased between September 2020 and December 2020.

Chart 5  
Monthly submissions per TR  
**CME volume absorbed by other TRs**



Note: Total number of daily submissions per month and TR. 'TRDDR' is DDRL, 'TRUNV' is Unavista, 'TRRGS' is Regis-TR, 'TRCME' is CME TR, 'TRICE' is ICE TVEL, and 'TRKDP' is KDPW. KDPW is on the right-hand side vertical axis. Figures for KDPW (November 2020) are underestimated with around 6mn records due to a technical issue when processing the data files. Source: Trade Repositories and ESMA calculations

<sup>11</sup> Currently, there are portability guidelines only under EMIR.

# EMIR reporting trends and data quality metrics

This section presents the main EMIR reporting trends in 2020. The presented analysis shows how the COVID-19 pandemic and Brexit have impacted EMIR reporting trends through the emergence of increased market volatility and volume shifts. Furthermore, an overview of selected data quality metrics used by ESMA to monitor and to assess data quality of regulatory reporting by counterparties and the subsequent report generation by TRs with a focus on reconciliation and revalidation is also included in this section.

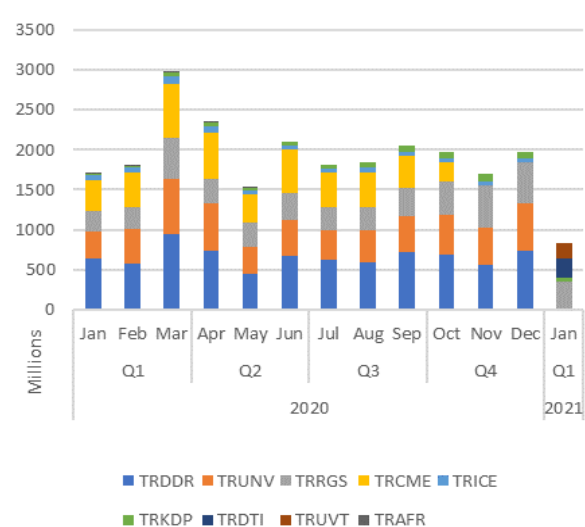
## Data reporting – key trends

EMIR reporting trends can be viewed through various dimensions of the data, such as the number of life-cycle events, contract types, or by asset class.

Submissions are the life-cycle event reports (represented by the EMIR action type field) received by the TRs representing the conclusion, modification, valuation, and termination of a derivative throughout its life. When market volatility is high, it may affect reporting counterparties' trading behaviour, leading to an increase in traded volumes, which in turn will result in an increase in the number of reported submissions.

**Key trends:** As illustrated in Chart 6, the beginning of the COVID-19 pandemic in March was marked by a significant jump in the number of submissions from February to March 2020. Following the peak in March 2020, the number of daily submissions remained at elevated levels throughout the year, while dropping significantly post-Brexit, as UK counterparties ceased to report under EMIR (see also the previous section on Recent developments across EMIR and SFTR reporting regimes).

Chart 6  
Monthly submissions per TR  
**Monthly number of reported submissions follows market developments**

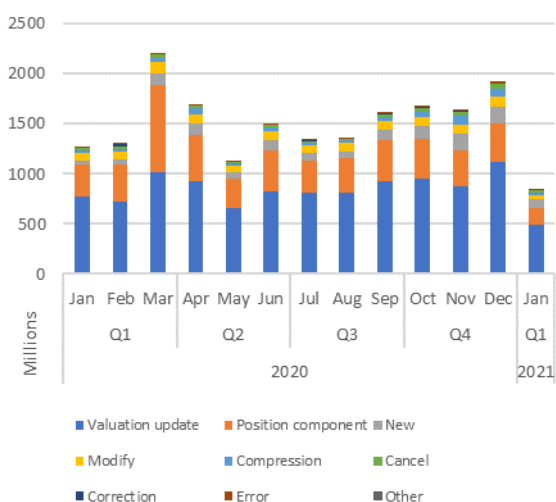


Note: Total number of submissions per month and TR. 'TRDDR' is DDRL, 'TRDTI' is DDRIE, 'TRUNV' is Unavista (UK), 'TRUVT' is Unavista (NL), 'TRRGS' is Regis-TR, 'TRCME' is CME TR, 'TRICE' is ICE TVEL, 'TRAFR' is NATR, and 'TRKDP' is KDPW.

Source: Trade Repositories and ESMA calculations

A closer look at the action types, which represent the type of a submission, is provided in Chart 7. The high volatility in March 2020, is reflected in the increased number of submissions with certain action types: there is a significant increase in the number of valuation and collateral updates as well as a doubling in newly submitted trades and position components between February and March 2020.

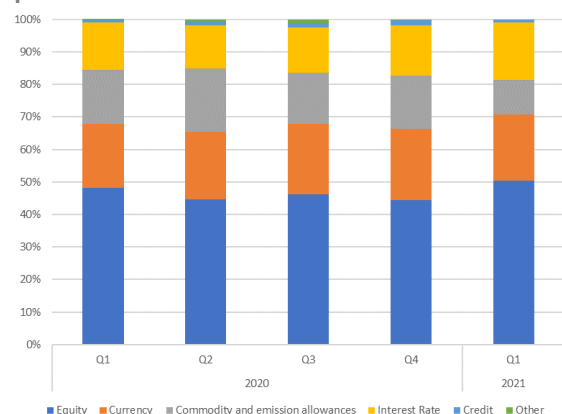
**Chart 7**  
Number of submissions per action type  
**Valuations are the most common submitted action type**



Note: Total number of submissions per month and action type.  
Source: Trade Repositories and ESMA calculations

As can be seen in Chart 8, the shares of the number of submissions by asset class did not undergo significant changes from the beginning of 2020 to the beginning of 2021, although there were minor fluctuations. Equity derivatives represent the biggest share, followed by Currency derivatives, Interest Rate derivatives, Commodity and emission allowances derivatives, and finally Credit derivatives.

**Chart 8**  
Submissions by asset class  
**Equities are the most common EMIR asset class**

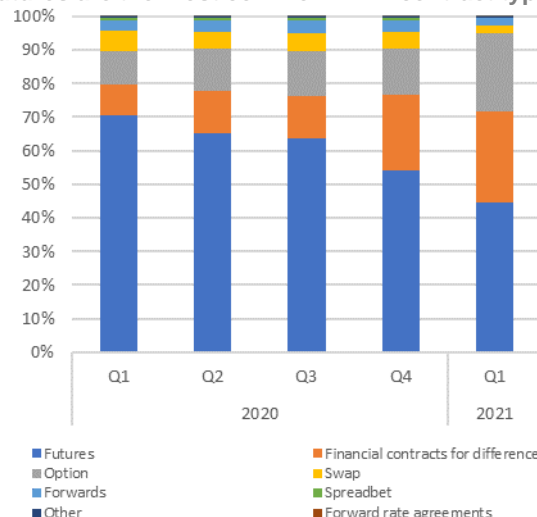


Note: Total number of daily submissions per quarter and asset class. As % of total.  
Source: Trade Repositories and ESMA calculations

When looking at the evolution of submissions by contract type throughout 2020 (see Chart 9), there is a significant decline in the number of Futures contracts from approximately 70% in the beginning of 2020 to less than 50% in January 2021. In contrast, Financial contracts for difference and Options almost doubled in volume and represent the second and third most relevant

contracts from a data submission perspective. For the other contract types (Forwards, Swaps, Spreadbets, and Forward Rate Agreements), the changes are less pronounced.

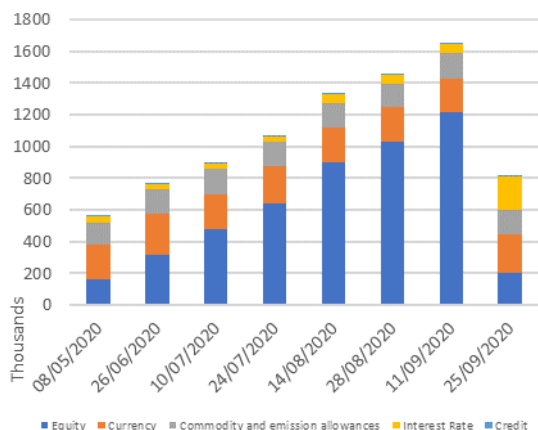
**Chart 9**  
Submissions by contract type  
**Futures are the most common EMIR contract type**



Note: Total number of daily submissions per quarter and contract type. As percentage of the total.  
Source: Trade Repositories and ESMA calculations

**Data inflation issues:** As part of its supervisory activities, ESMA monitors the accuracy of TR regulatory reports. In this context, ESMA identified several issues during 2020. An example for one such data quality issue is the inflation in the number of open contracts during the summer of 2020 observed in data from one TR (Chart 10). Data inflation issues have also been identified at other TRs. In this case, the number of open equity contracts increased significantly between July and early September 2020. This was caused by one reporting counterparty that was not reporting in line with EMIR requirements. ESMA liaised with the relevant stakeholders and the issue was resolved by late September. This issue underlines how crucial it is that counterparties report in line with regulatory expectations. Misreporting by a single counterparty can undermine economic/financial stability analysis performed by data users.

Chart 10  
Open contracts reported by one TR  
**Number of open contracts inflates during the summer 2020 at one TR**



Source: Trade Repositories and ESMA calculations

### Data completeness, timeliness, and availability

Counterparties are required to report newly concluded derivative contracts within a specific timeline to a TR of their choice. To assess the timeliness of reporting by counterparties, ESMA considers the difference between the “Execution timestamp”, reflecting the date and time of a derivative contract’s conclusion, and the “Reporting timestamp”, reflecting the date and time of reporting to the TR.

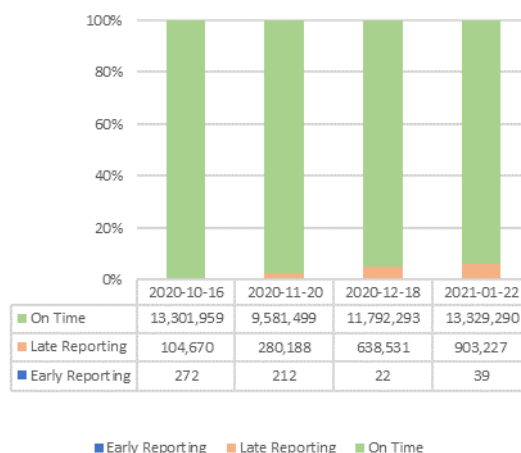
A derivative is considered “reported on time”, if it is reported by the working day following the day on which the contract was concluded, at the latest. A derivative is considered “late reported”, if it is reported later than the working day following the day on which the contract was executed. A derivative is considered “early reported”, if it is reported earlier than the date specified in the “Execution timestamp” field.

Coordinated Universal Time (UTC) is not converted to local time. This approximation speeds up the calculation but could give rise to some degree of inaccuracy (i.e. records wrongly classified as “Late Reporting” due to UTC vs local time differences) impacting the overall results.

**Execution vs. Reporting timestamps** In Chart 11, the distribution of the execution timestamps in the daily submissions is shown for the three buckets and for specific dates between November 2020 and January 2021. While early reporting remains marginal, there is a steady increase from 104,670

reports received late in November 2020 to 903,227 reports received late in January 2021.

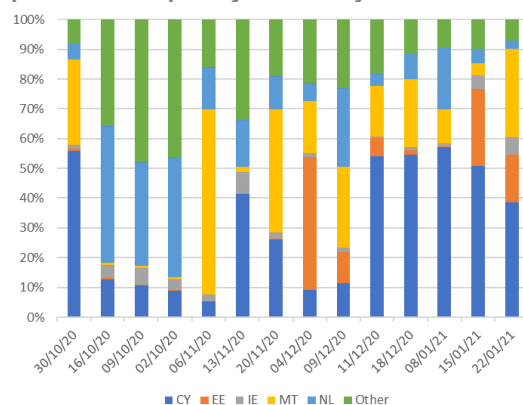
Chart 11  
Execution timestamp of daily submissions  
**Around 7% of daily submissions are late in early 2021**



Note: A derivative executed at time T and reported at T+1 at latest, is considered “On Time”. A derivative executed at time T and reported after T+1 is considered “Late Reporting”. A derivative executed at time T and reported before T is considered “Early Reporting”.  
Source: Trade Repositories, GLEIF and ESMA calculations

When looking at the evolution of late reporting at a weekly frequency for the period between October 2020 and January 2021 in Chart 12, there is a (slightly fluctuating) increase for daily submissions that are reported late.

Chart 12  
EMIR late reporting – percentages of daily submissions considered as reported late, by Member State  
**Counterparties from a few Member States tend to report most frequently with delays**



Source: Trade Repositories, GLEIF and ESMA calculations

ESMA and the NCAs discussed the above-mentioned issues in the first quarter of 2021, resulting in a follow-up by some NCAs with the identified counterparties. Further analysis of the timeliness will be undertaken, considering observations from the first round. Such observations may also potentially feed into the

regular analysis of the timeliness of the reports, that is already performed on an annual basis under the DQAP.

**Non-reporting:** It is not possible to make a definitive estimation as to the exact number of non-reported derivatives. However, given the dual-sided reporting obligation, it is possible to shed some light on the potential scale of the issue. For the purposes of the analysis, ESMA considers cases where there are no open derivatives reported from the side of the other counterparty (i.e. CP1 reports open derivatives against CP2 and CP2 does not report any against CP1).

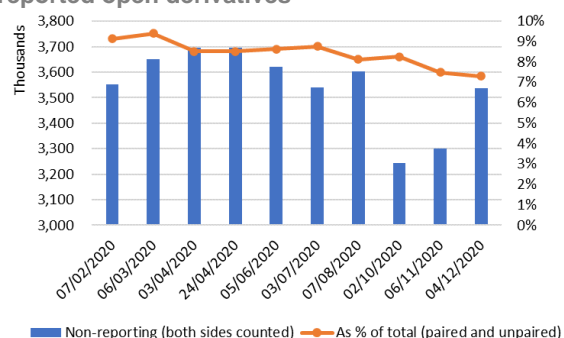
According to ESMA’s estimates, there tend to be between 3,2 and 3,7 million of open non-reported derivatives on a given reference date during 2020 (see Chart 13). If non-reporting of associated life-cycle events were to be counted also, the number of non-reported submissions would likely be significantly higher.

In relative terms, the issue represents 8-9% of all open reconcilable derivatives (i.e. paired and unpaired) for a given reference date. Most potentially non-reported open derivatives come from large European financial centres.

There are a variety of reasons for these potentially non-reported derivatives including, but not limited to one counterparty reporting more derivatives than it is legally required to report, differences across Member States on the definition of a derivative and outright non-reporting.

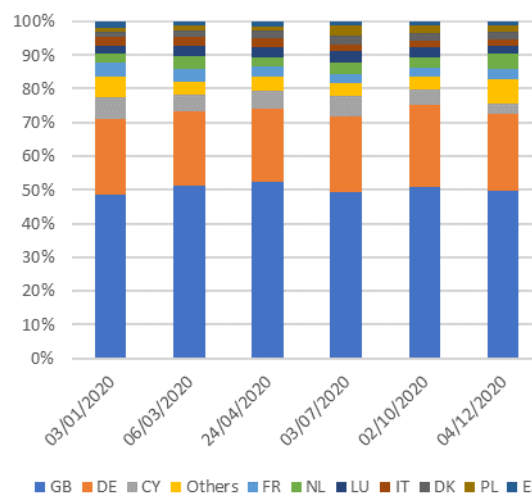
ESMA’s intention is to increase its focus on potential non-reporting in the future and will be sharing such identified issues with the NCAs during 2021.

Chart 13  
Non-reporting: Number of open derivatives with second leg missing  
**Continuously high number of potentially non-reported open derivatives**



Note: ESMA estimates the number of non-reported derivatives by counting the number of open derivatives, where there is no open derivative reported from the point of view of the other counterparty (after excluding open derivatives where the other counterparty is a non-EEA firm). The estimation of non-reported derivatives is made on the population of open derivatives on a given reference date. Source: Trade Repositories and ESMA calculations

Chart 14  
Non-reporting by Member State  
**Member States with most potentially non-reported open derivatives**



Note: The estimation of non-reported derivative is made on the population of open derivatives on a given reference date. ESMA estimates the number of non-reported derivatives by counting the number of open derivatives where there is no open derivative reported from the point of view of the other counterparty (after excluding open derivatives where the other counterparty is a non-EEA firm). Member State of non-reported derivatives is made based on determination of country of ID of the other counterparty. ESMA does not take potential delegation of reporting by NFC under EMIR Refit into account. Source: Trade Repositories, GLEIF and ESMA calculations

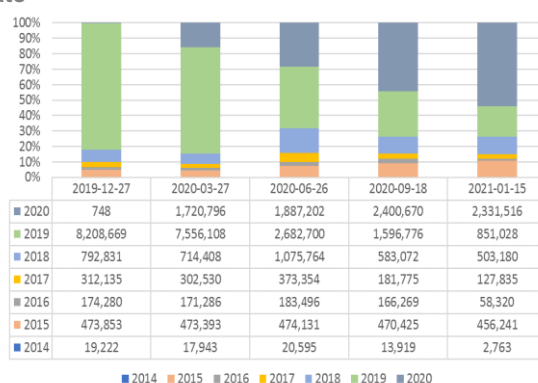
**Non-reporting of valuations by counterparties:** EMIR requires that financial and non-financial counterparties above the clearing threshold report daily the valuation data relating to their open trades and positions, as well as any relevant updates to the value of collateral exchanged.



The results of the analysis for several reference dates in end 2019, 2020, and early 2021 reveals large volatility in the timeliness of reported valuations (see Chart 15). The overall number of valuations considered stale for the purposes of this analysis varied between 4 and 11 million open derivatives. It shows that a significant portion of open derivatives subject to daily valuations did not receive updates for several years. There are hundreds of thousands of open derivatives with a valuation timestamp ranging from 2015 to 2018, which could indicate misreporting practices by counterparties and/or outstanding derivatives that have not been properly terminated (i.e. “dead” trades). Another issue observed is that some valuation timestamps are in the future. There were 748 open derivatives of end-December 2019 with valuation timestamp in 2020, which points again to inconsistent reporting of valuations.

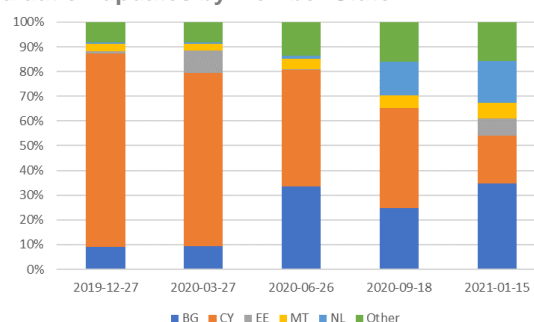
The non-reporting of valuations may relate to derivatives which have not been terminated appropriately. NCAs and ESMA have been analysing completeness, timeliness, and accuracy of reporting of valuations by counterparties for several years during the annual DQR. Additionally, a special focus was placed on the reporting of valuations in 2019 and 2020, by making it subject to the DQR’s ‘thematic review’. Considering the importance of the valuation data for economic/financial risk analysis, ESMA and NCAs will continue focusing on correctness and timeliness of valuation reporting going forward.

Chart 15  
Timeliness of valuations reporting by counterparties  
**Percentage of open derivatives with valuation timestamps older than one month from reference date**



Note: The analysis uses all open derivatives on given reference date open derivatives with action type = “N” (new) or “V” (valuation) and clearing threshold = “Y”. Open derivatives with valuation timestamps that fall within a month of the reference date of the open derivatives are excluded (i.e. considered as recently updated). Each open derivative is allocated to a “Year” bucket in order to measure the magnitude of number of outstanding trades that have not received a valuation update between 2014-2020  
Source: Trade Repositories and ESMA calculations

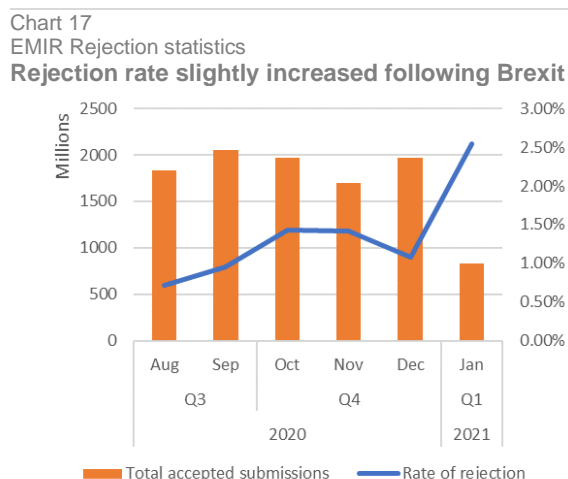
1  
Chart 16  
Timeliness of valuations reporting by counterparties  
**Percentage of open derivatives with outdated valuation updates by Member State**



Source: Trade Repositories and ESMA calculations

### Data accuracy – adherence to format and content

Based on the rejection statistics provided by TRs, Chart 17 shows an overall low rejection rate. However, following Brexit the rejection rate has been slightly increasing.

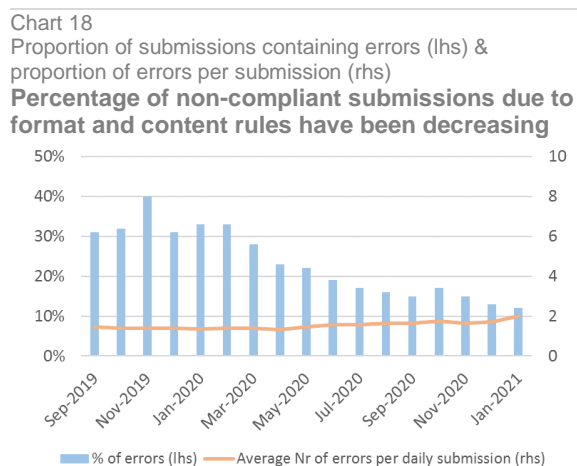


Source: Trade Repositories and ESMA calculations

**Revalidation:** When a counterparty submits data to a TR, the latter needs to validate whether the incoming trade data is in line with the regulatory reporting requirements. For this purpose TRs have implemented ESMA validation rules against which they check the incoming data. TRs are to reject trades that are not adhering to the validation rules.

Since the introduction of the validation rules in late 2015, ESMA regularly performs a revalidation of the data TRs make available to assess whether TRs have implemented the validation requirements correctly. In ESMA's analysis, a randomly selected data sample extracted from one daily submission report per month is used. Each data point is checked against the ESMA validation rules in force at the time of checking. Following the identification of an issue, e.g. a specific field that causes an increased number of rejections, ESMA engages with the relevant stakeholder(s) to remediate the issue at hand.

In Chart 18, the proportion of daily submissions containing errors is shown together with the average number of errors per daily submission. While the proportion of daily submissions containing errors has decreased from the peak of 40% in November 2019 to 12% in January 2021, the average number of errors per submission has slightly increased from 1,4 to almost 2.



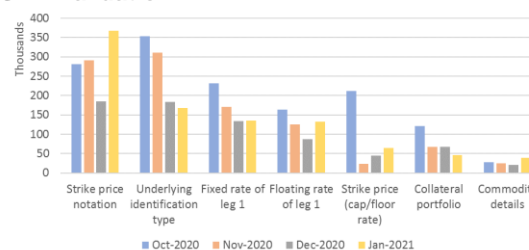
Note: The analysis uses a randomly selected data sample (~15%) extracted from one daily submission report per month. Each data point is checked against the current ESMA validation rules.

Source: Trade Repositories and ESMA calculations

A more detailed view on the fields most commonly failing the revalidation process is provided in Chart 19, showing the distribution for the identified EMIR fields from October 2020 to January 2021.

NCA's and ESMA monitor rejections as well as corrections of the rejected reports by the counterparties as part of the regular DQAP exercise.

**Chart 19**  
Top failing fields from re-validation from aggregated data  
**Strike price notation with most rejections by ESMA validation**



Note: The analysis uses a randomly selected data sample (~15%) extracted from one daily submission report per month. Each data point is checked against the current ESMA validation rules.

Source: Trade Repositories and ESMA calculations

### Data integrity – reconciliation

The need to reconcile the data stems from the dual-sided reporting obligation. As such, data reconciliation is one of the key processes to assess data quality under EMIR. As counterparties are responsible for agreeing among themselves the details that are to be reported to TRs<sup>12</sup>. TRs are then tasked with

<sup>12</sup> See EMIR Q&A 17  
[https://www.esma.europa.eu/sites/default/files/library/esma7-0-1861941480-52\\_qa\\_on\\_emir\\_implementation.pdf](https://www.esma.europa.eu/sites/default/files/library/esma7-0-1861941480-52_qa_on_emir_implementation.pdf)

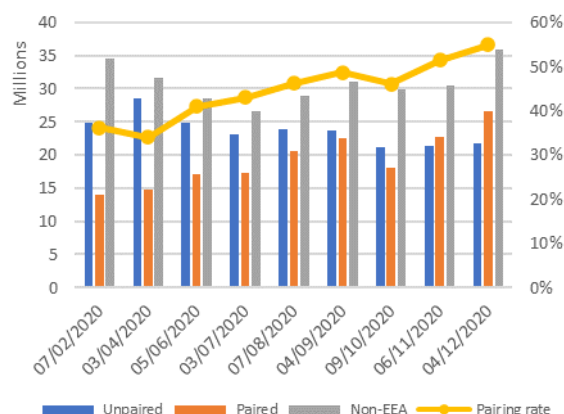
performing data reconciliation as a way of confirming that the two sides of each derivative have indeed been reported with the same information.

To monitor that TRs are correctly following the established process and that the reporting counterparties report the information correctly, ESMA simulates the reconciliation process internally. ESMA regularly shares results of the analysis with the NCAs.

The EMIR reconciliation process is split into two distinct phases, namely: (i) pairing; and (ii) matching. A derivative is successfully paired when the TR(s) are able to identify both legs of the reported derivative based on the unique key (i.e. reporting counterparty ID, ID of the other counterparty, and trade ID). Derivatives, where the ID of the other counterparty belongs to a non-EEA country, are excluded from the process as the other counterparty does not have a reporting obligation. Non-LEIs in ID of the other counterparty should be subject to reconciliation where a TR keeps both legs of each derivative. However, such open derivatives are excluded from the inter-TR reconciliation process. Upon successful pairing, TRs perform matching on the remaining details of the reported derivative.

Historically, pairing has been problematic. Chart 20 shows the results of ESMA paired open derivatives through 2020. Although pairing has increased from around 40% to 53% (totalling circa 20 million unpaired open derivatives at the end of 2020), the rate is still very low considering that successful pairing requires counterparty agreement on three fields only.

Chart 20  
Paired, unpaired and non-EEA open derivatives  
**Pairing rate has been increasing, but remains low**



Note: A derivative is considered paired when the two legs of each open derivatives are identified based on three fields: ID of reporting counterparty, ID of the other counterparty, and trade ID.

Source: Trade Repositories and ESMA calculations

There are numerous reasons for the lack of pairing including, non-reporting (see the above section 'Data completeness, timeliness, and availability – Non-reporting'), disagreement on the generation of trade ID or on position vs. trade level reporting.

Due to the expectation that both counterparties agree with each other on the details that are to be reported to TRs, one would expect that the number of derivatives reported by any two counterparties between each other should be the same. In such a situation, it would be more likely that those open derivatives can be successfully reconciled, i.e. paired, and then matched.

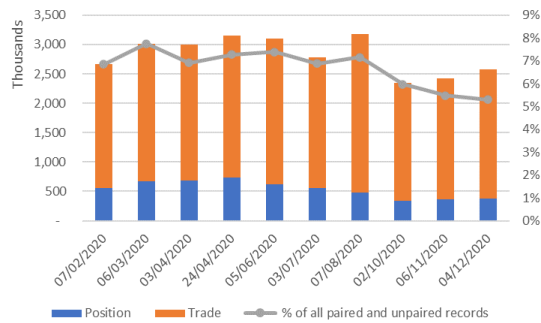
However, as can be seen from Chart 21 there is approximately a difference of 2.5 to 3 million in the number of derivatives that two counterparties, which conclude and report numerous derivatives between them, report against one another. For example, one counterparty may report 1000 derivatives concluded with another counterparty, while the latter counterparty may report only 1 derivative concluded with the former counterparty. In this case, there is a difference of 999 derivatives.

In relative terms, the issue represents between 5.3 and 7.4% of the total open derivatives on a given reference date (as percentage of all reconcilable open derivatives, i.e. paired and unpaired, excluding non-EEA and GB open derivatives).

The results illustrate that, among other things, successful reconciliation is being inhibited by the lack of agreement between counterparties on some fundamental aspects of the reportable information such as the number of derivatives that counterparties concluded with each other. This impacts particularly the reporting of cleared derivatives.

Similar to reporting of valuations, NCAs and ESMA have been focusing on reconciliation since the inception of EMIR. As a TR supervisor, ESMA has been monitoring that TRs perform reconciliation according to an agreed process and that they present the accurate results of the process to NCAs as well as counterparties. ESMA and NCAs have also been focusing on reconciliation during the annual DQRs, including analysis of the specific reasons for pairing and matching breaks.

Chart 21  
Difference in the number of open derivatives reported by each of the two sides of that derivative  
**Counterparties disagree on the number of reportable open derivatives**



Reconciliation remains a key data quality issue and it requires further attention from ESMA and NCAs.

Note: 'Position' stands for position level reporting, 'Trade' stands for trade level reporting. Counterparties are expected to agree on the level of reporting between each other. Computed as the difference between the number of open derivatives reported by counterparties between each other where at least one open derivative is reported in both directions.

The percentage is calculated as fraction of all paired and unpaired open derivatives (excluding non-EEA open derivatives). Open derivatives belonging to GB are excluded as well.

Source: Trade Repositories and ESMA calculations

# SFTR reporting trends and data quality metrics

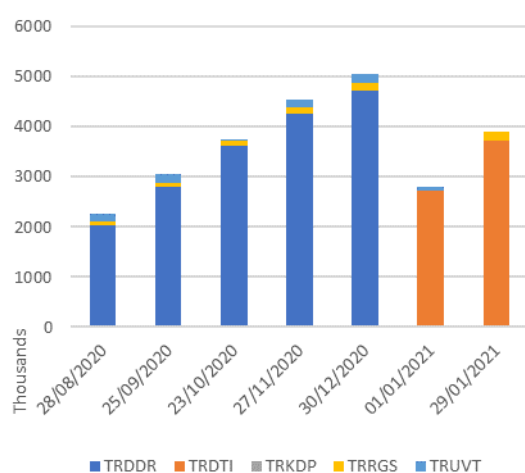
This section provides a first overview of selected SFTR data reporting trends following the entry into force of the reporting obligation in July 2020<sup>13</sup>. ESMA will provide more extensive data quality assessment in future iterations of this report.

## Data reporting – key trends

The actual data reporting under SFTR started in July 2020 (instead of the original April date, due to COVID-19) and has been phased-in gradually for different types of counterparties<sup>14</sup>. Therefore, the observed trends span over a rather short period of about six months.

**Key trends:** The volumes of open SFTs per TR show that the vast majority is reported to DDRIE (DDRL until Brexit), while the remainder is divided amongst UnaVista, REGIS-TR and KDPW (see Chart 22).

Chart 22  
Open SFTs by TR  
Steep drop in number of open SFTs reported by TRs following Brexit

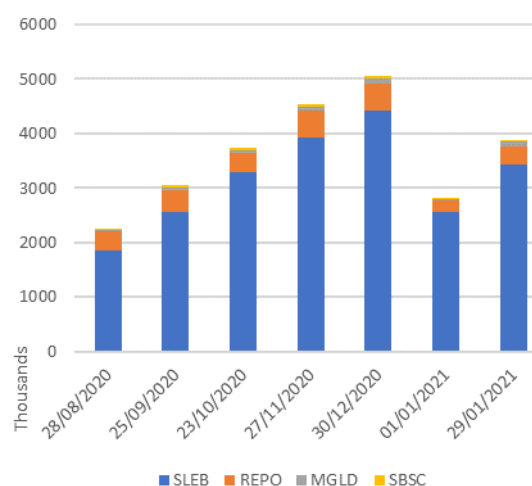


Source: Trade Repositories and ESMA calculations  
Note: DDRL becomes DDRIE and known as TRDTI

Chart 23 shows the evolution of the number of open SFTs for each month from August 2020 to January 2021. The data series shows an increasing trend just up to the Brexit date, where a major drop occurred. This significant decrease

in the number of open SFTs is due to the removal of the SFTs reported by UK counterparties. According to the data, the open SFTs have been increasing again since January 2021. The vast majority of reported SFTs are securities lending and borrowing transactions and repurchase agreements (repos).

Chart 23  
Open SFTs by SFT type  
Securities lending and borrowing most frequent SFT type



Note: SLEB is securities lending and borrowing, REPO is repurchase agreement, MGLD is margin lending, SBSC is buy-sell back.  
Source: Trade Repositories and ESMA calculations

A further characteristic of the SFTR landscape is the type of counterparty, as depicted in Chart 24. Most submissions have, so far, been reported by investment firms and credit institutions (around 90% of open SFTs). UCITS contribute to around 7% of open SFTs.

The reporting of SFTs was introduced gradually, starting effectively from 11 July 2020. The phased applicability depended on the type of counterparties involved: the first phase in effect

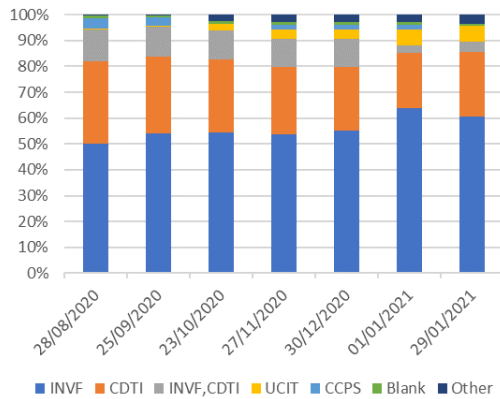
<sup>13</sup> Actual reporting started in 13 July 2020 due a short postponement of the reporting obligation due to COVID-19.

<sup>14</sup> Reporting obligations for credit institutions, investment firms, central counterparties (CCPs), central securities depositories (CSDs) and relevant third-country entities started on 13 July 2020 followed by insurance companies, funds, institutions for occupational retirement provision (IORPs) and relevant third-country entities on 12 October 2020 and non-financial counterparties on 11 January 2021.

For more see [https://www.esma.europa.eu/sites/default/files/library/esma80-191-995\\_public\\_statement.pdf](https://www.esma.europa.eu/sites/default/files/library/esma80-191-995_public_statement.pdf)

consisted of Credit Institutions, Investment Firms, CCPs and CSDs, and relevant third-country entities; the second phase applied to Insurance companies, Funds, IORPs and relevant third-country entities; and the third phase applied to non-financial counterparties.

Chart 24  
Open SFTs by sector of counterparty  
**Investment firms and credit institutions report by far the most SFTs**

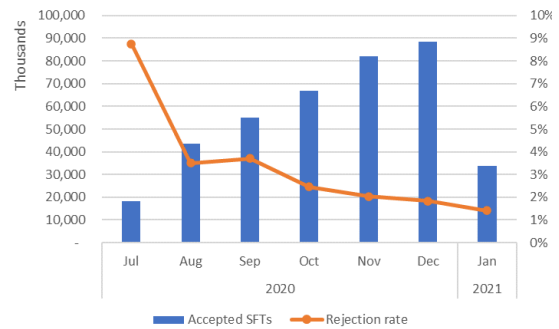


Note: 'INVF' are investment firms, 'CDTI' are credit institutions, 'UCIT' are UCITS and its management companies, and 'CCPS' are central counterparties.  
Source: Trade Repositories and ESMA calculations

### Data accuracy – adherence to format and content

A first overview of the data quality under the SFTR reporting regime is given in Chart 25. While the number of rejected SFTs was highest in the early months of the reporting obligation in July 2020, a significant decrease was observed over the whole period. The overall rejection rate peaked at 9% in July 2020 and declined to below 2% in January 2021.

Chart 25  
SFTR monthly submission volumes and rejections  
**Declining rejection rate following reporting go-live in mid-2020**



Source: Trade Repositories and ESMA calculations

# Methodological Annex

## EMIR reporting trends and data quality metrics

**Data reporting – key trends:** ESMA monitors key trends in the reporting volumes by performing a count of all daily submissions and open derivatives for a given reference date by action type, asset class and contract type.

**Data completeness, timeliness, and availability – execution vs. reporting timestamps:** ESMA measures the timeliness of reporting by counterparties by applying the following three assumptions: (1) derivatives executed at time T and reported at T+1 at the latest, are considered “On Time”, (2) derivatives executed at time T and reported after T+1 are considered “Late Reporting”, and (3) derivatives executed at time T and reported before T are considered “Early Reporting”. Daily submissions with action type N (New) or P (Position component) reported at transaction level (Level = T) are used for this analysis. For each submission in the sample, we compute the difference between the “Reporting Timestamp” and the “Execution Timestamp” expressed in days. Coordinated Universal Time (UTC) is not converted to local time. This approximation speeds up the calculation but could give rise to some degree of inaccuracy (i.e. records wrongly classified as “Late Reporting” due to UTC vs local time differences) impacting the overall results. Moreover, to better measure the magnitude of timeliness reporting, each submission is allocated into buckets, (1) On time: [0d to 1d], (2) Late Reporting: [1d to 5d], [5d to 30d], [30d to 360d], [>360d], and (3) Early Reporting: [-1d to <0d], [-5d to -1d], [-30d to -5d], [-30d to -360d], <-360d].

**Data completeness, timeliness, and availability – non-reporting:** ESMA estimates the number of non-reported derivatives by counting a number of open derivatives reported between a counterparty pair (i.e. EMIR fields ‘Reporting counterparty ID’ and ‘ID of the other counterparty’) in both directions (i.e. CP1 vs. CP2 and CP2 vs. CP1) and taking a difference in those instances where open derivatives were reported only in one direction. Non-EEA counterparties and open derivatives with non-LEIs in ID of the other counterparty are excluded from the calculation. Member State of non-reporting is identified by the country of LEI in ‘ID of the other counterparty’ using the GLEIF reference data.

**Data completeness, timeliness, and availability – non-reporting of valuations by counterparties:** ESMA measures non-reporting of valuations by counterparties by analysing all open derivatives on given reference date with action type = N (new) or V (valuation) and clearing threshold = Y. Submissions with valuation timestamps that fall within one month of the reference date are excluded (i.e. considered as recently updated). Each open derivative is allocated to a “Year” bucket in order to measure the magnitude of number of outstanding trades that have not received a valuation update between 2014-2020.

**Data accuracy – adherence to format and content – revalidation and rejection rates:** ESMA performs a data revalidation process on the daily submissions to detect data quality issues linked to the validation process of TRs. The analysis uses a randomly selected data sample (~15%) extracted from one daily submission report per month, per TR. Each data point is checked against the current ESMA validation rules.

Rejection statistics produced by TRs are aggregated by ESMA and used to monitor how many reports are being rejected by TRs due to misreporting by CPs.

**Data integrity – reconciliation:** ESMA performs reconciliation process on open derivatives on a given reference data by replicating the process applied by the TRs. Firstly, non-EEA open derivatives are excluded from reconciliation.

Pairing is performed by finding second leg of each derivative by using a unique key (i.e. EMIR fields ‘Reporting counterparty ID’, ‘ID of the other counterparty’, and ‘Trade ID’). The second leg of a derivative

is found by looking CP1-CP2-TID vs CP2-CP1-TID. Both sides of each derivative are counted towards the aggregate values.

The difference in the number of reported derivatives is calculated by counting a number of open derivatives reported between a counterparty pair (i.e. 'Reporting counterparty ID' and 'ID of the other counterparty') in both directions (i.e. CP1 vs. CP2 and CP2 vs. CP1) and taking a difference.

### **SFTR reporting trends and data quality metrics**

**Data reporting – key trends:** Statistics on key SFTR trends are calculated by counting open SFTs included in TR regulatory reports for a given reference date. Breakdowns are calculated by using SFTR fields 'Type of SFT' and 'Nature of reporting counterparty'.

**Data accuracy – adherence to format and content:** Total number of accepted and rejected SFTs is computed from dedicated TR regulatory reports containing aggregated as well as SFTs level information on rejected and accepted SFTs submitted to TRs by counterparties.



# List of abbreviations

BIS	Bank for International Settlements
CCP	Central Counterparty
CD	Credit Derivatives
CDS	Credit Default Swap
CFD	Contract for Difference
CM	Clearing Member
CO	Commodity Derivatives
CSD	Central Securities Depositories
CP	Counterparty
CU	Currency Derivatives
DQAP	Data Quality Action Plan
DQR	Data Quality Review
EEA	European Economic Area
EMIR	European Markets Infrastructure Regulation
EQ	Equity Derivatives
ESMA	European Securities and Markets Authority
ETD	Exchange Traded Derivatives
FC	Financial Counterparty
FSB	Financial Stability Board
HHI	Herfindahl-Hirschman Index
IORP	Institutions for Occupational Retirement Provision
IRD	Interest Rate Derivatives
IRS	Interest Rate Swaps
ISDA	International Swaps and Derivatives Association
LEI	Legal Entity Identifier
MIC	Market Identifier Code
MiFIR	Markets in Financial Instruments Regulation
NCA	National Competent Authority
NFC	Non-Financial Counterparty
OTC	Over-the-Counter
REPO	Repurchase Agreement
RTS	Regulatory Technical Standard
SFT	Securities Financing Transaction
SFTR	Securities Financing Transactions Regulation
TR	Trade Repository
UCITS	Undertakings for Collective Investment in Transferable Securities

Countries abbreviated according to ISO standards

Currencies abbreviated according to ISO standards



European Securities and  
Markets Authority

